NOVEMBER 13, 1995 VOLUME 12, NUMBER 46

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

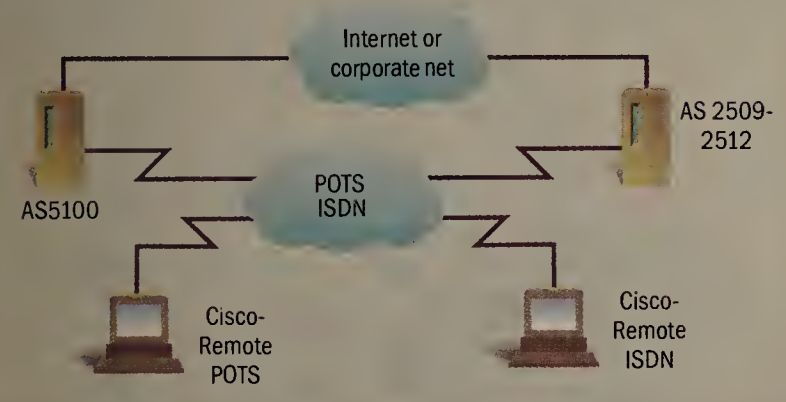
SOFTWARE SECURE

ISVs to plug holes in Win95. See page 10.

Lotus adding military strength encryption to Notes. See page 14.

REMOTE POSSIBILITIES

Cisco's new CiscoRemote software will support remote access to the Internet and corporate resources over dial-up and ISDN lines through Cisco access servers.



Cisco pushes remote

Remote access pack paves path to corporate, 'Net assets.

By Jim Duffy
San Jose, Calif.

Cisco Systems, Inc. is soon expected to roll out a suite of PC-based software that supports high-performance dial-up access to corporate nets and the Internet from remote sites.

The CiscoRemote software bundles a Web browser, electronic mail, file-transfer, terminal-emulation, data acceleration and remote control applications, as well as IP and IPX client software.

CiscoRemote was obtained from three different vendors,

See **Cisco,** *page 16*

Ain't no stoppin' NT

Microsoft storms market with BackOffice hooks, client integration and pure market muscle.

By Kevin Fogarty and Peggy Watt
Redmond, Wash.

What do Windows, Word, Excel and Windows NT have in common? They were all, at one time, called flops by an impatient computer industry.

Windows NT was dubbed a dud early on because it did not fulfill Bill Gates' promise to sell one million copies — either clients or servers — in its first year.

While Gates missed that goal, Microsoft Corp. confounded critics by selling a million copies of the NT server alone in about two years. With that installed base and a major revision under

See **Windows NT,** *page 102*

WINDOWS NT ROLLS ON

Recent customer wins:

Union Carbide: Installing 100 NT servers.

Duke University Medical Center: Replaced a VAX 6210 with an NT server supporting 400 mixed clients.

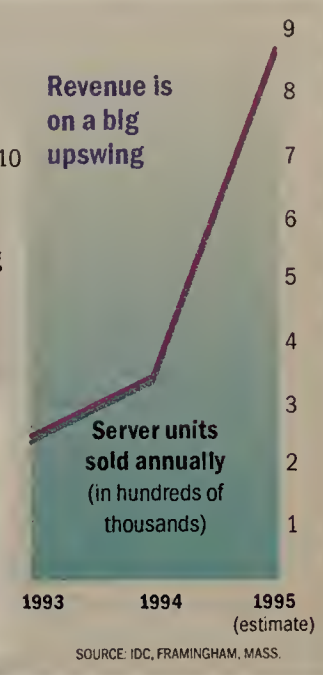
Countrywide Funding: Deployed 80 NT servers.

The Great Atlantic & Pacific Tea Co.: Implementing 250 NT servers.

Alcoa: Installing 450 NT servers and 10,000 NT workstations.

Recent ISV wins:

Vendor	Product gaining NT support
IBM	SystemView, NetView and DB2
Novell	NetWare client, NetWare Directory Services, Tuxedo
Intel	LANDesk Manager
Banyan	StreetTalk
Oracle	Workgroup Server



SOURCE: IDC, FRAMINGHAM, MASS.

Big Blue hosts TCP/IP party

By Michael Cooney
New Orleans

IBM is priming its TCP/IP pump.

Over the next 18 months, the company will roll out TCP/IP features for mainframes and OS/2 that will make it easier to integrate these platforms into rapidly expanding TCP/IP domains.

Company executives discussed the product plans at the Guide International Corp. user group meeting here last week.

New products will include an upgraded version of TCP/IP for MVS and VM, IBM's mainframe-based TCP/IP software, as well as new TCP/IP features for its OpenEdition/MVS (OE), IBM's Unix-based mainframe technology. New TCP/IP features will also be added to IBM's OS/2 Warp as well as its family of wireless products.

"Mainframe users have needed some of these features for a long time," said Dixon Doll, chairman and chief executive officer of the DMW Group, a consultancy in Menlo Park, Calif. "In many cases, IBM has come up

See **TCP/IP,** *page 105*

ON-LINE

Dive further into IBM's TCP/IP plans on **Network World Fusion.** Resources include a look at IBM's plan to add TCP/IP to VTAM. From the main menu, select **News+** then **Front Page.**

CompuServe ATM service to go on-line

By Tim Greene
Columbus, Ohio

CompuServe, Inc. will expand its managed services portfolio next year with a bundled ATM offering that includes customer premises equipment and end-to-end management, as well as support for frame relay sites.

Users will access CompuServe's Asynchronous Transfer Mode network at T-1 or T-3 speeds, or those in between, using ATM inverse multiplexing, which allows customers to pool multiple T-1 links for more capacity. CompuServe will likely offer Cisco Systems, Inc. and Bay Networks, Inc. ATM

See **CompuServe,** *page 16*

In-Site

ATM from LAN to WAN

By Tim Greene
New York

What started out last year as a calculated experiment with an ATM LAN has paid off so well for Wall Street securities trader Donaldson, Lufkin & Jenrette that the firm is making a gutsy move into the wide area.

In the high-speed world of securities, a 100M bit/sec

Continued on page 108

STEVE BORNS

DLJ's *Speight sees a new 'network simplicity.'*

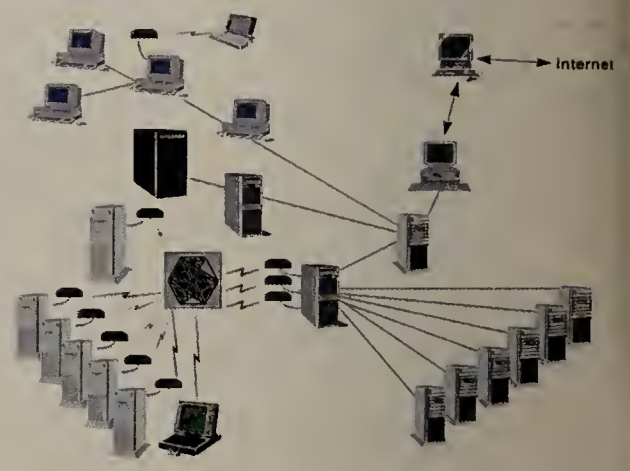
SPECIAL SECTION

What's wrong with wireless?

Corporate America was supposed to be largely untethered by now, but some of those lifelines are proving hard to cut. Here's a look at the stumbling blocks and a review of some wireless LAN products that may yet set you free. **Coverage begins on page 64.**

An AS/400® Advanced Series Solution

Behind Bill Downs' success in keeping Earth safe from alien life-forms



is a client/server network that sends sales data throughout the Sega® empire instantly

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than other platforms.

When your business grows from zero dollars to a billion dollars in five years, choosing a client/server system that can keep up with the growth is pretty important. Which is what Bill Downs of Sega has found with AS/400 Advanced Series.

"In five years, we probably would have had two or three different business systems if we had started with something that didn't scale as easily as AS/400," says Bill. "None of us had the idea we would grow as fast as we did."

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This Week

News+

The Front Page:

- Grab a copy of our LAN interconnectivity Buyer's Guide.
- See how Windows NT stacks up against NetWare and VINES in our reviews.

The Technical Sections:

- X.400 vs. SMTP: The debate that never dies. Choose a side in Client/Server Applications.
- **Industry Watch:** Todd Dagres doubts most of today's Internet providers will be around in a few years. Read why in Net Business.

Forum

Your side: Run across any unusual Web sites? Post their URLs in nwfusion.talk, Topic 10 – "Oddball site du jour."

NetRef

Technology Resources: Thinking of switching to a client/server E-mail package? We've put together a package of migration articles in E-mail.

Other areas

- Professional Development: New seminars.
- DirectConnect: Download demo software.
- Network World Central: Get in touch with us.

this week's pick

Dan Kegel is a man with a mission: Tell the world about ISDN. Kegel's ISDN page has hundreds of well-organized links to ISDN resources, from basic primers to mailing list archives to vendor lists. http://www.alumni.caltech.edu/~dank/isdn/

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NetworkWorld

An IDG Publication

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Sheldon Laube *gives Novell an all-important user perspective. Page 2L.*

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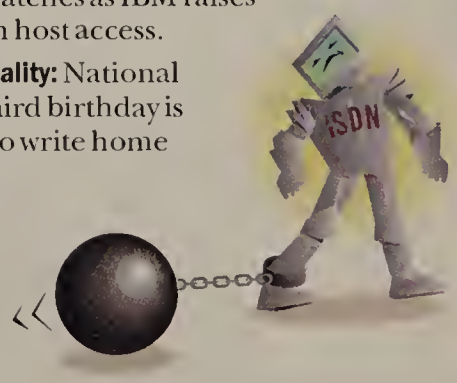


NetworkWorld's *Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.*

News briefs, November 13, 1995

MQSeries management breakthrough

Apertus Technologies, Inc. next month will roll out the first application designed exclusively to manage IBM's MQSeries messaging middleware environments. The MQView application will let users monitor performance and other vital MQSeries-based vital signs necessary to keep a distributed environment running smoothly. Pricing begins at $10,000.

HP opens Windows

Next month, Hewlett-Packard Co. will ship a version of its OpenView for Windows Workgroup Node Manager application that can run on Windows 95 and Windows NT workstations. The new release will have a homegrown remote Desktop Management Interface browser and 32-bit device polling code, said Claude McDonald, HP OpenView for Windows product manager.

MCI gets musical

In what some analysts say may be an exemplary move to inspire firms to buy more 800 services, MCI Communications Corp. last week got into the music retail business. Via deals struck with record label companies and by using an interactive voice response-based architecture, the carrier has set up its own 800 business. Consumers dialing 1-800-MUSIC-NOW will be able to route themselves to different artists or music categories, listen to a record and buy it. The service will be available over the World-Wide Web at the end of the month.

Encryption battle rages on

Gore

The networking industry last week rallied to condemn the Clinton administration's encryption policies, claiming the current export restriction rules on products hinder U.S.-based companies from competing internationally. In a letter to Vice President Al Gore, more than 35 companies and trade associations — including AT&T, MCI Communications Corp., Microsoft Corp, Novell, Inc. and Lotus Development Corp. — blasted the government's key-escrow effort in which the administration is trying to get companies to build products that use an encryption technology that gives the government the ability to decrypt users' encrypted data.

Banyan reshuffles again

Banyan Systems, Inc., which has been losing market share to net operating system rivals Novell, Inc. and Microsoft Corp., last week announced its third reorganization of the year. The company said it will lay off about 10% of its 850-person workforce and concentrate the rest in two business groups: the Enterprise Networking Division and the Internet Business Division. All the VINES and Enterprise Network Systems products will be grouped in the Enterprise Networking Division. The Internet Business Division will sell and develop BeyondMail and Internet-related products such as the Internet Business Directory.

Big Blue butcher knife

IBM last week laid off another 1,200 employees, slicing evenly across most of its divisions but hitting net product facilities the hardest. About 200 people will lose their jobs at IBM net product locations in the Raleigh, N.C., area. Some analysts expect more cuts, especially in the networking hardware arena. IBM has cut its workforce by close to 90,000 since restructuring began in 1993.

Nortel PBX enhancements on TAPI

Northern Telecom, Inc. this week will demonstrate integration of its Meridian 1 private branch exchange system with Release 2 of Microsoft Corp.'s Telephony Application Programming Interface (TAPI) for Windows NT at Comdex/Fall '95. TAPI 2.0 will fulfill Microsoft's long-standing promise to support third-party call control, which lets users launch calling commands from a PC to a server linked to a PBX.

COMDEX

AT&T charts new territory

Carrier will link voice response to the Web.

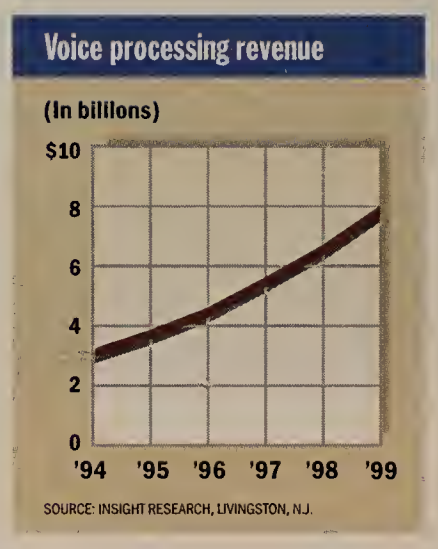
By Joanie Wexler
Las Vegas

Network managers will still be hungry for details after AT&T sketches out its Internet hosting strategy this week at the Comdex/Fall '95 show here, but at least they will get a taste of voice response technology to come.

AT&T is expected to outline its planned suite of World-Wide Web programming, hosting and professional services but will not offer much on availability or pricing, sources said.

The Web hosting services reportedly will not be commercially available until the second half of 1996.

However, AT&T will continue with its latest kick to intertwine all its network services platforms with one another and with the Web. As part of this, the company will outline plans to link its InfoWorx interactive voice response (IVR) service platform to its Web hosting platform, sources said. This would let end customers use for the first time a voice interface to a Web site to conduct transactions.



Meanwhile, users of AT&T Web services who also use Easylink will have the option of allowing their customers to contact their Web site via electronic mail or fax to complete transactions. At the back end, AT&T would run electronic data interchange links to credit card verification houses, customer databases or other hosts.

Tests new reach-me service for critical voice communications.

By David Rohde
Bedminster, N.J.

AT&T has begun internal testing of a hybrid paging system and audioconferencing bridge designed to let mobile employees reach one another on the fly, *Network World* has learned.

The service, known as Personal Reach, is currently being tested by about 100 key staffers in the carrier's Business Communications Services unit.

The trial will be expanded to about 5,000 AT&T employees in December, but the general availability date has yet to be set.

Each customer subscribing to the service is assigned an 800 number and a generic one-way pager, explained Dick Stieglitz, AT&T's national marketing manager for call center solutions and one of the executives working on the pilot test.

When a caller wishes to reach a subscriber, he dials the 800 number and is asked to enter a personal identification number (PIN). The PIN can be the caller's telephone number or any other code that alerts the subscriber to the caller's identity, Stieglitz said.

The PIN appears on the subscriber's pager but, unlike an ordinary paging service, the caller remains on the line for 1 minute in an AT&T conferencing bridge. The subscriber then can decide whether to take the call, in effect, by getting to a telephone and dialing another 800 number directly in to the bridge.

The caller is sent back to the subscriber's voice mailbox if the subscriber deliberately does not respond to the page or is unable to locate a telephone within 60 seconds, Stieglitz said.

But even then, the subscriber has the opportunity to treat the call as an ordinary page by dialing the caller's telephone number directly.

The service would not be completely unique. Ron Lipoff, president of Arch Communications, Inc. in Westborough, Mass., runs a similar paging service using a platform from Wilmington, Mass.-based Priority Call Management. "There are a lot of companies doing what we do," he said.

Stieglitz conceded that the service, if offered by AT&T to business subscribers and the general public, could chew up a huge chunk of toll-free numbers since one is assigned to every subscriber. Earlier this month, the new 800 Users Coalition asked the Federal Communications Commission to order all paging and messaging services to stop putting their new subscribers on 800 numbers and use new, less well-known toll-free codes such as 888 (see story, page 28).

Stieglitz noted that additional toll-free codes, such as 877 and 866, are also being prepared for future use and said AT&T was willing to consider their use for this service.

Dial up more information on Network World Fusion, including a look at follow-me services from other vendors. From the main menu, select News+ then WANs & Internetworking.

TCP/IP and 3270 links from the AT&T network to those back-end hosts are expected down the line.

AT&T will offer AT&T-developed IVR applications — in conjunction with the Web service or stand-alone — to its 800 customers and smaller businesses that may not be able to afford call centers and prefer to outsource.

IVR equipment averages $2,800 per port, according to Tele-Mac, a consulting firm in Foster City, Calif. IVR equipment can range from four ports to several hundred. This can cost users anywhere from $10,000 to close to $1 million in upfront capital outlays should they invest in the gear and run it on their own premises.

But large 800 customers might hesitate before turning over their call center operations.

"The question comes down to cost and control," said the telecommunications director of a large catalog order house who asked not to be identified. ■

Senior Writer Tim Greene contributed to this story.

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In-Site

Publisher gets the scoop on ATM-based VLANs

By Jim Duffy
Phoenix

Phoenix Newspapers, Inc. hopes its move into a new headquarters next year will be as easy as moving devices around its new switched network.

The company's pending relocation will give it an opportunity to scrap its shared-media LANs and build an Asychronous Transfer Mode-based virtual LAN. The VLAN is being installed to help the newspaper publisher easily move staffers between workgroups, pass bandwidth-hungry graphics and text files around faster, and reduce broadcast traffic.

"Like every other company on the planet, we have adds, moves and changes on our network," said Allen Hsu, systems support team leader at Phoenix Newspapers. "VLANs allow you to implement those changes with a lot less fuss and mess. For lack of a better term, it's kind of a sys/admin nirvana."

VLANs are LAN segments in which endstations are logically connected via drag-and-drop software commands, regardless of the endstations' physical location. Media access control (MAC) and network layer addresses of endstations do not change when they are moved from segment to segment, making it less of a hassle to move them about.

Switched VLANs increase throughput because endstations are assigned dedicated 10M or 100M bit/sec pipes rather than having to share bandwidth, like they do on traditional LANs. Also, switches can process packets faster than routers, bridges or hubs.

In addition, VLANs enable the establishment of broadcast domains, where frames can be isolated to a logical segment or subnet, instead of propagated throughout the net.

When operational in late 1996, Phoenix Newspapers' VLAN will connect 1,400 endstations — including 50 to 100 servers — across 10 floors of the company's new building.

Backbone equipment, comprising Cisco Systems, Inc. LightStream 100 and 2020 ATM switches, as well as 7000 routers, will be situated on the fifth floor of the building. At least one Cisco Catalyst 5000 will be situated on each floor to provide switched 10M and 100M bit/sec to each desktop.

Fiber-based ATM links will connect the switching and routing nodes at 155M bit/sec. The 7000s will provide routing between VLANs, while the 2020 will be used for WAN access and attachment of other equipment, such as private branch exchanges.

Of the three VLAN configuration options available — defining segments by port, Layer 2 MAC address or Layer 3 network address — Phoenix Newspapers will opt for Layer 3 due to its ability to limit the use of stand-alone routers and to keep broadcast traffic to a minimum.

"Layer 2 switches can't get around [broadcasts]; they're going to pass those on," Hsu said. A Layer 3 implementation, though, will seal off some of that traffic, so people only see the resources they actually need to.

In evaluating vendor VLAN offerings, Phoenix Newspapers considered products from Bay Networks, Inc., Cabletron Systems, Inc. and Newbridge Networks, Inc. But the company found these offerings to be too Layer 2-centric or too dependent on a backbone switch with centralized route processing.

Under Phoenix Newspapers' plan, the Cisco 7000 routers will calculate routes between VLANs and set up broadcast domains. They will also function as LAN Emulation servers, providing LAN-to-ATM and ATM-to-LAN address translation on behalf of endstations and other devices.

This information will be distributed to the Catalyst 5000s so they can forward frames and cells to appropriate VLANs.

"The router becomes almost a minimal-use device on the network," Hsu said. "We're going to use the 7000 literally as a communications control device for the 5000s."

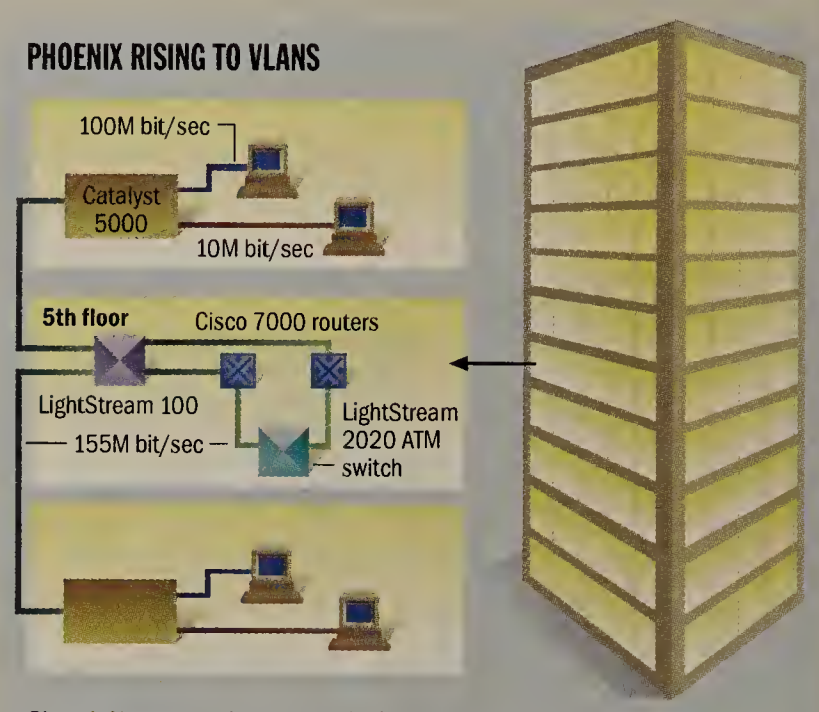
Luckily for Phoenix Newspapers, the company doesn't have a large installed base of shared-media LAN gear to meld into its switched VLAN. Hsu said he is chucking all existing LAN interface cards, hubs and bridges, and starting from scratch with a switched environment.

That way, he can avoid some of the drawbacks of integrating legacy LANs and VLANs, such as resolving addressing and broadcast issues.

"I can start with a brand-new IP addressing scheme and a brand-new VLAN scheme, and can build it up sensibly and change it later," Hsu said.

For users with a large installation of shared-media LANs that need some of the benefits that VLANs promise, Hsu recommended proceeding with caution. All they may need to do is deploy a router strategically, he said.

Hsu also warned LAN managers not to be swayed by vendor hype. "Those that have a significant legacy investment will find it more difficult to implement [VLANs]," he said. "There's a lot more deployment planning than [vendors] have implied is necessary." ■



Phoenix Newspapers' new network will help the company shuffle its staff among workgroups on the fly, increase data-transfer performance and isolate broadcast traffic. Cisco 7000 routers will shuttle traffic among virtual LANs supported by Cisco's LightStream ATM switches and Catalyst LAN switches.

NetManage preps Chameleon desktop for intranet access

By Peggy Watt
Cupertino, Calif.

NetManage, Inc. is drawing on its slate of Internet management tools to help network managers run their intranets, too.

The developer of Chameleon expects to ship this month NewtWatch 4.6, a network management tool that applies the Internet access and application management of Chameleon 4.6 to internal networks.

NetManage added software distribution functions and backup utilities, as well as enhancements to the suite of Chameleon TCP/IP applications to make them more useful locally.

"NewtWatch is an attempt to help network managers administer clients through their Chameleon applications," said John Guertin, NetManage product manager.

For example, the new backup functions are TCP/IP-based, so they are easily invoked remotely when a net manager dials in using Chameleon. Backups can be managed from and to any server on the net, and can be programmed for specific times.

For consistency, NewtWatch 4.6 also has an updated interface with the tab-style menu choices that Windows 95 uses. The revised NewtWatch runs on Windows 3.X, Windows 95 and Windows NT.

WebSurfer, which is NetManage's browser, is enhanced for use as a trigger to activate software distribution across a LAN or even across the Internet, Guertin said. It can handle either "push" installations from server to clients or "pull" installations, which is when client workstations retrieve applications from the server for local installation.

Several new screen options monitor and display desktop operations, access habits and use of resources, Guertin said.

The release of NewtWatch 4.6 accompanies an update to Chameleon, which is also being positioned as an intranet desktop.

Spinning the WebSpider

In addition, NetManage this month is shipping several updates to its Chameleon family of Internet products, adding a WebSpider HyperText Mark-up Language (HTML) editor, and enhancing WebSurfer and Personal Web Server applications.

WebSpider provides a WYSIWYG editor for HTML documents, supporting basic design functions; the document can be published using the Personal Web Server. The Server now supports the Common Gateway Interface and can track and log user connections.

The updated WebSurfer supports HTML extensions — which accommodates in-line video and audio — as well as off-line reading and transmissions up to 128K bit/sec.

Several applications in the Chameleon Desktop collection have minor enhancements in Version 4.6, including serial connections to telnet and 3270 printer support through the host access application.

Chameleon is also available with Network File System support, targeting intranet use of the desktop by expanding the applications' access to other servers on an enterprise network. These servers are displayed in the Windows file manager under 3.X and NT or in Explorer under Windows 95.

NewtWatch 4.6 is priced at $495. Chameleon for Windows 4.6 and the feature-equivalent Chameleon for Windows 95 5.0 cost $400 each. ChameleonNFS for Windows 4.6 costs $495. ChameleonNFS for Windows 95, to ship next year, will cost $495.

✆NetManage: (408) 973-7171.

Clarification

It was reported in the Aug. 28 issue that IBM's license of Windows 95 would enable it to use code to ensure application compatibility with OS/2 Warp. Actually, IBM is only licensing Windows 95 as an option for bundling with its hardware, not its software.

Corrections

Figure 2 in the Nov. 6 review "From NetWare to Eternity" (page 49) was a screen shot of Quarterdeck's IWare Connect, not MCS' Inetix.

Last week's issue incorrectly reported on the performance of Intel Corp.'s Pentium Pro processor. Intel said last week that a 166-MHz Pentium Pro is 1.6 times faster than a standard 133-MHz Pentium.

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Patching cracks in the Windows

Software vendors seek to plug security holes in Windows 95 with add-on products; Microsoft denies any security flaws in operating system.

By Ellen Messmer
Washington, D.C.

Claiming that Microsoft Corp. delivered Windows 95 without adequate security features, a variety of software vendors are developing add-on products that improve Windows 95's access controls or encrypt data.

Microsoft denies there are any security flaws in Windows 95 but concedes the operating system lacks elements such as password-based screen saver lock-out that are needed in industries where security is important, such as financial services.

Nature abhors a vacuum, so password-based lock-out and other discretionary access controls are being added to Windows 95 by vendors with security expertise.

"Windows 95 is an advanced operating system that provides no security," said Lina Liberti, product manager at Mergent International, Inc. "For instance, it's easy to bypass the Windows 95 logon screen if you're a hacker."

Mergent early next year will ship PC/DAC for Windows 95, a $149 software package that lets managers establish desktop controls that prevent logon or file access by unauthorized users.

"In the financial services industry, when you walk away from any computer, you have to lock it down. With Windows NT, you can lock it down, but with Windows 95, you can't."

"Windows 95 offers zero security," said Bruce Clay, vice president of PC Dynamics, Inc., which two weeks ago shipped Safehouse, a $39.95 piece of software that lets users create a virtual hard disk on PCs' hard drives for holding encrypted data.

Rob Bennett, product manager at Microsoft's personal systems division, acknowledged that Windows NT, which earned a baseline C2 security rating from the Department of Defense, could be viewed as a better choice than Windows 95 for corporations in some cases.

"In the financial services industry, when you walk away from any computer, you have to lock it down," Bennett said. "With Windows NT, you can lock it down, but with Windows 95, you can't."

Bennett suggested vendors may be criticizing Windows 95 security simply to sell security products.

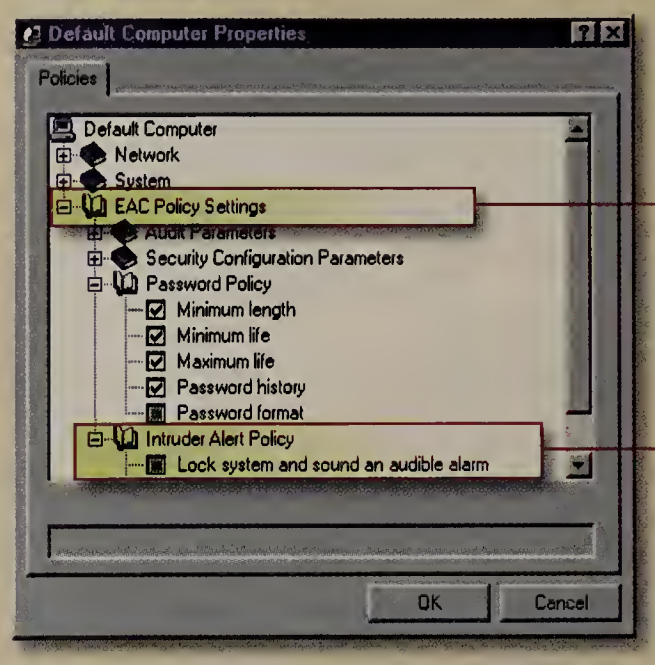
Fischer International Systems Corp. is in beta with what it calls the Safe Boot, a software and hardware combo for Windows 95 access control. Safe Boot allows access to a PC only when the user types in the correct password and a hardware component, called the Smart Disk, is in the disk drive. Safe Boot stores all programs and files in encrypted form.

Axent Technologies, Inc. is developing OmniGuard/Enterprise Access Contol for Windows 95 that lets systems administrators set up user IDs, password policy and audit configuration, as well as file access rights and encryption. The product, priced at $195 per seat, is expected for release early next year.

PC Guardian, Inc. expects to ship Workstation Manager Plus for Windows 95, software that lets an administrator set restrictions on user logon and file use. The software, priced at $149 per user, is expected to ship by year-end.

✆Mergent: (860) 257-4223; PC Dynamics: (800) 888-1741; Fischer: (800) 237-4510; Axent: (301) 258-2620; PC Guardian: (800) 288-8126.

Securing Windows 95



Enterprise Access Control feature in Axent Technologies' OmniGuard lets administrators set rules for users sharing files.

Intruder Alert Policy sets guidelines on what actions to take upon detection of intruder.

Systems mgmt.

Computer Associates lowers price of CA-Unicenter management software

By Jim Duffy
Islandia, N.Y.

Computer Associates International, Inc. last week revamped the pricing of its CA-Unicenter systems management software and said the product now includes agent technology from recently acquired LEGENT Corp.

CA has implemented a pricing scheme based on the raw compute power of the front-end clients and back-end servers on which customers run the management software.

The cost reduction is intended to make CA-Unicenter more flexible and cost-effective for users to deploy.

The pricing structure, which CA calls "power unit pricing," lowers the entry point of CA-Unicenter from $700 per client or server to $400 per system.

This could save companies installing hundreds of power units thousands of dollars, according to Illuminata, Inc., a research firm in Nashua, N.H.

The cost reduction is intended to make CA-Unicenter more flexible and cost-effective for users to deploy, and to help CA capture more market share, said Sanjay Kumar, CA president and chief operating officer.

The new pricing model extends to all CA-Unicenter products that run on Windows NT, NetWare and SCO Unix platforms. Analysts said users can now acquire licenses and negotiate volume discounts across platforms, whereas licenses previously were based on single platforms.

"It makes a lot of sense for those organizations that are rolling this out to a large number of platforms and systems," said Paul Mason, director of enterprise systems management at International Data Corp. in Framingham, Mass.

CA also announced the integration of LEGENT's Agentworks technology into CA-Unicenter.

Agentworks allows users to establish some CA-Unicenter consoles as mid-level domain managers, which localize polling traffic to specific network domains, or enterprise consoles, which oversee all domains.

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BMC and Compuware gobble up net, apps management players

By Barb Cole
Austin, Texas

Two rival companies that specialize in tools for managing distributed databases went on buying sprees last week to extend their reach into the network and application management space.

BMC Software, Inc. acquired HawkNet, Inc., a developer of software for tuning Novell, Inc. NetWare servers, and Peer Networks, Inc., which makes a kit for embedding Simple Network Management Protocol agents into software or devices.

The acquired companies' products will still be available through BMC, but BMC will also work much of the technology into its Patrol database and application management products. Terms of the deals were not disclosed.

Meanwhile, BMC rival Compuware Corp. of Farmington Hills, Mich., is banking on the $30 million acquisition of CoroNet Systems it finalized last week to improve the application management capabilities of its EcoTools database management product line. Compuware will market the CoroNet Management System, which measures and tracks client/server applications across networks, under the name EcoNet as part of its EcoTools suite, according to company officials.

Analysts said the acquisitions should help BMC and Compuware capture a bigger chunk of the management software market while providing users with more integrated management tools.

"It's not enough to know what is going on with the database. You need to know what's up with the network and the applications," said Paul Mason, an analyst at International Data Corp. in Framingham, Mass. BMC and Compuware are looking to give users in-depth information about databases, applications and the network from a central point, he said.

Strategic goals

Although the companies are targeting the same market, their strategies are somewhat different, analysts said.

For instance, BMC is positioning its Patrol tools for managing databases and applications that run on platforms ranging from mainframes to NetWare LANs. The company this week will announce a version of Patrol for managing IBM DB2, Oracle Corp. Oracle7 and Software AG of North America, Inc. Adabas databases running on MVS-based mainframes. As a result, users will be able to manage mainframe, client/server and departmental databases from a central console running BMC software, said Wayne Morris, product marketing manager at BMC.

Patrol users said the MVS support is key for large corporations that still have databases running on mainframes.

"Today, we don't know the mainframe is going awry until we get a phone call from a user," said a database administrator for a telecommunications company in the Midwest. The company uses Patrol to manage Unix-based databases and plans to employ it with an Oracle database running on MVS.

"We'll just add more icons to the existing screens of our Level 1 support people and catch problems [on the mainframe database] before users do," he said.

BMC is also planning to incorporate Peer Network's SNMP technology into Patrol, enabling the program to pull information from multiple SNMP sources and work with SNMP-based systems management platforms, company officials said.

In contrast, Compuware will leverage the technology it is obtaining through the acquisition of Los Altos, Calif.-based CoroNet to hone in on managing Unix-based databases and applications.

EcoNet and Compuware's existing EcoTools suite will be integrated by the end of 1996. As a result, the products will be able to recognize each other's SNMP alerts and let users do end-to-end response time monitoring across network and systems resources. The software also will be integrated at the user interface level on Windows NT.

✆BMC: (713) 918-8800; Compuware: (810) 737-7300.

BMC'S BUYOUT

	Peer Networks, Inc.	HawkNet, Inc.
Company:		
Based:	San Jose, Calif.	Carlsbad, Calif.
Founded:	1987	1993
Primary products:	Optima, a kit for embedding SNMP agents into software or devices; Torpedo, a customizable net management development package	NetTune Pro, a NetWare Loadable Module that uses artificial intelligence to tune NetWare servers; NetReport, a reporting tool for capacity planning and managing databases
Key competitors:	SNMP Research, Epilogue	Peregrine Systems, Frye Utilities

Integrated NetWare and Windows NT manager on tap from BindView

By Kevin Fogarty
Houston

BindView Development Corp. is enhancing its NetWare management package to support Windows NT LANs and let companies blend network management data with information stored in corporate databases, sources said.

The full-function version of the product will not be available until the first half of 1997, but gradual enhancements are due to ship about every six months beginning early next year.

The first version, due during the first quarter of next year, will include a set of APIs that can tie the product that can pull data out of corporate databases using either Microsoft Corp.'s Open Database Connectivity API or OLE. That version will also support the Desktop Management Task Force's Desktop Management Interface.

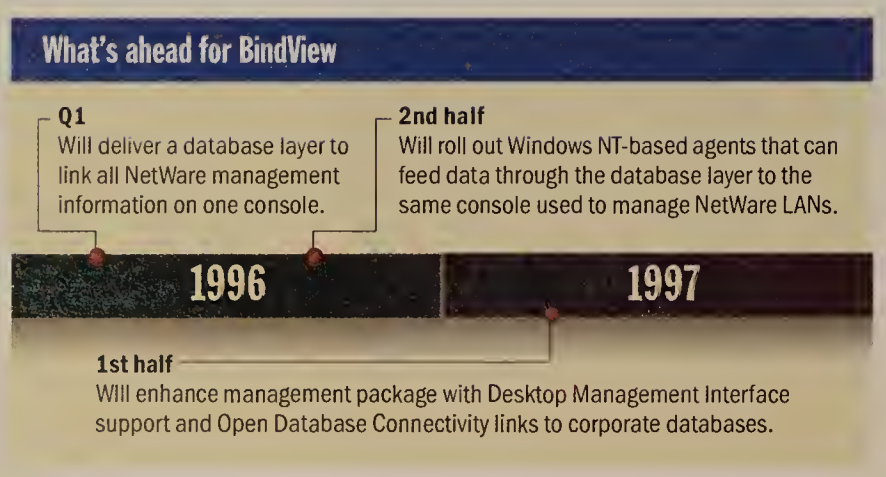
BindView also plans to build a software developers' kit designed to let corporate customers build applications that tap into data collected via the management tool, sources said.

"They're taking tools that have only been available on databases and making them available to net managers," said one source close to BindView, who asked to remain anonymous. "Products like [Hewlett-Packard Co.'s] OpenView and [IBM's] NetView are really node maps. This is taking management information and presenting it like a database."

There is a market for a tool that links corporate information with management data, but BindView will not be the first to enter it, said Jim Lisiak, senior software engineer at Chevron Information Technology Co. in San Ramon, Calif. Microsoft's Systems Management Server (SMS) and Symantec Corp.'s Norton Administrator are both management products with database hooks. SMS also has APIs that make management data available to Microsoft's Excel spreadsheet, or applications written in Visual Basic, Lisiak said.

"If [BindView] is going to do that, it would need to do it fairly quickly. If they're looking at '97, they'll be out of the game," said Lisiak, who uses SMS and Norton Administrator in his net. ■

What's ahead for BindView



Combining the data will make it easier for companies to track not only the status of their nets and the resources on them, but also information about who is on the network.

Net managers could use the product, plus reporting tools under development at BindView, to build end-user profiles that include data from personnel databases, network operating system logon files and BindView's inventory management product.

By identifying all users with a particular set of job responsibilities, for example, a net manager could provide them all with a consistent set of software updates and access rights.

From the console, companies will be able to manage applications, servers and workstations, conduct hardware and software inventories, and do security audits.

Late next year, BindView plans to deliver a series of Windows NT-based agents that provide those same abilities for NT servers. Users will be able to manage NT and NetWare LANs from the same console.

In the first half of 1997, BindView plans to ship a version of together data from all of BindView's management products, NetWare binderies and directories, and present it on one console.

Lotus enlists in Army with Notes military version

By Ellen Messmer
Washington, D.C.

Lotus Development Corp. quietly has begun developing a version of its Notes product that will use military security instead of commercial encryption technology.

Notes DMS, which will be marketed to businesses and civilian government agencies, as well as the Department of Defense, may not have much appeal initially in the commercial sector. But that could change — particularly abroad — if the Clinton administration drops export restrictions on software that uses key-escrow features for encryption or bans nonescrowed encryption.

Notes DMS will have the same replication and electronic mail features available in Notes today.

Developed under the aegis of the government's giant Defense Message System contract, Notes DMS will have the same replication and electronic mail features available in Notes today.

But to please the Defense Department, which views unbreakable commercial encryption as a threat to national security, Lotus will jettison the RSA Data Security, Inc. encryption technology it has used until now in Notes for authenticating, signing and encrypting documents.

In its place will be the military's Capstone encryption algorithm, the Digital Signature Standard (DSS) and the

See **Lotus,** *page 16*

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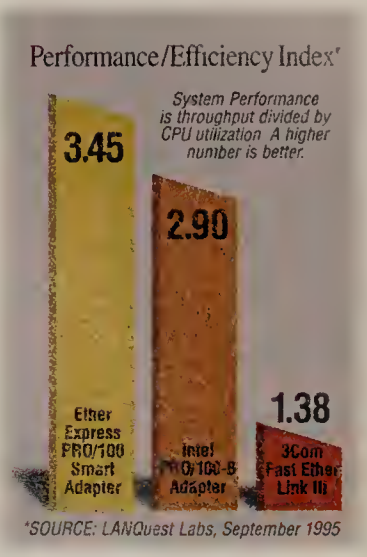

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Cisco

Continued from page 1

according to sources. Little, if any, CiscoRemote code was written by Cisco itself, they said.

Nonetheless, analysts say remote access client software is a natural opportunity for any company that is pursuing the remote access market with the zeal that Cisco is.

"We've certainly been recommending to all of those companies that here's this opportunity for a client suite," said Michael Howard, president of Infonetics Research Institute, Inc., based here. "Users want to have more things integrated and want it all to operate as a single unit."

Added Jeremy Duke, senior analyst at In-Stat, Inc. in Scottsdale, Ariz., "[CiscoRemote] is kind of the missing piece ... pulling everything together."

Currently, Cisco resells remote access client software from Network TeleSystems, Inc. (NTS) of Sunnyvale, Calif., and Stampede Technologies, Inc. of Dayton, Ohio, as options for use with its access servers. CiscoRemote is expected to replace those offerings.

A Cisco spokeswoman would neither confirm nor deny the CiscoRemote roll out, which is expected before year-end.

CiscoRemote runs on Windows PCs and supports dial-up analog and ISDN connections into Cisco's AS5100 and 25XX access servers.

Most of CiscoRemote is supplied by NTS, sources said. NTS is providing NetScape's Navigator Web browser; Eudora electronic mail; FTP file transfer; telnet terminal emulation; a high-performance, virtual device driver TCP/IP protocol stack; IPX client software for access to NetWare servers; tn3270 code for access to IBM hosts; and PPP and SLIP protocols.

NTS President John Davidson declined to comment.

Vendors responsible for the rest of CiscoRemote are AirSoft, Inc. of Cupertino, Calif., and Farallon Computing, Inc. of Alameda, Calif., sources said. AirSoft is providing its Powerburst software, which increases the performance and throughput of remote data transfer. And Farallon is providing Timbuktu Pro remote control software, which allows remote users to share file and print services over IP nets, and lets administrators control access to those services.

Gary Krall, AirSoft vice president of marketing, declined to comment. Farallon President and Chief Executive Officer Alan Lefkof said there is a "collaborative relationship between Farallon and Cisco" coming up but declined to divulge details.

Sources say CiscoRemote is aimed at Shiva Corp. and its LanRover product line. Shiva has shipped more than twice as many remote access ports as Cisco, according to In-Stat.

CiscoRemote will cost less than $200 and will be immediately available, sources said.

Meanwhile, Cisco announced a new router for Windows NT servers.

The Windows NT router is called the CiscoPro CPA1120. It consists of Cisco's Interior Gateway Routing Protocol software integrated into the NT operating system, and an adapter card with a dedicated WAN processor and PPP software.

CiscoPro CPA1120 costs about $2,000 and will ship in the first quarter of 1996.

✆Cisco: (508) 526-4000.

Cisco launches Internet unit

Cisco Systems, Inc. has quietly formed a new business unit to focus on Internet-related markets, including electronic commerce.

Sources said the Internet Business Unit pulls together the operations of two recent Cisco acquisitions – Internet Junction, Inc., a maker of PC-to-Internet gateway software, and Network Translation, Inc., a developer of address translation and firewall equipment.

The new unit will provide hardware and software for simplified Internet access, sources said.

The unit will be led for now by Cisco Vice President and Chief Technology Officer Ed Kozel until Cisco finds a vice president/general manager to run the unit, sources said.

Cisco's desire to go after the electronic commerce market is underscored by the firm's minority stake in CyberCash, Inc., a maker of secure Internet transaction software. The value of the investment could not be learned by press time. Cisco confirmed formation of the new unit and the CyberCash investment.

By Jim Duffy

CompuServe

Continued from page 1

access gear as part of the offering.

The managed service, which will offer customers an easier way to get started with ATM networking, will be primarily data oriented. But the company may eventually offer a "multimedia" version for handling voice and video traffic over ATM links, said Robert McKinney, manager of internetworking services for CompuServe.

The ATM network will support available bit rate (ABR) service as well as other ATM qualities of service that the company would not detail. ABR is a flexible ATM service that allows connections to expand and contract as application needs dictate.

The new service, which CompuServe was reluctant to discuss, would offer a growth path for customers of the company's current managed frame relay offering, FRAME-Net. The ATM service will support so-called service interworking, which will allow frame relay and ATM sites to reside on the same network.

The ATM service could free users from many of the hassles of building and managing a network, said Beth Gage, broadband consultant at TeleChoice, Inc. in Verona, N.J.

CompuServe's *McKinney says his company may offer a multimedia service for handling voice and video over ATM.*

And it will put CompuServe among the elite crew of carriers offering managed ATM services. MFS Datanet, Inc. has a native LAN transport service based on ATM, and LDDS WorldCom, Inc. offers LAN Connection Services and Channel Networking Service, which includes equipment for converting LAN and SNA traffic to ATM cells.

That kind of service is becoming more attractive to resource-constrained network departments, according to Steve Taylor, president of Distributed Networking Associates in Greensboro, N.C.

Leeson Electric Corp. in Grafton, Wisc., is one such company, according to Mary Fonder, director of IS for the electric motor manufacturer. Leeson has a 30-site FRAME-Net network and is in the midst of migrating to a client/server architecture that will drive a need for ATM.

"There's going to be a lot more data going back and forth because [engineers] are going to be accessing CAD drawings from our server that they can't today," Fonder said.

But her information systems staff already is flat out. "We just don't have time to be managing [the WAN] at all. For CompuServe to do that for us makes a lot of sense," she said.

The frame relay/ATM service interworking is an attractive option. "Some of the offices are much larger than others. The ones that need the large bandwidth would be the ones to get ATM. We probably wouldn't go to ATM all at once," Fonder said. ■

Lotus

Continued from page 14

Message Security Protocol application programming interface developed by the National Security Agency.

The secret Capstone algorithm is firmware-based, hidden on a PCMCIA card called the Fortezza cryptocard, which also stores the user's private-key certificate (see story, page 57).

Capstone uses a key-escrow scheme that lets the government decrypt user data when needed.

Even though Lotus last week joined the industry chorus condemning the government's key-escrow policy in a letter to Vice President Al Gore, the company, sensing demand, is busy adapting its flagship Notes product to work with it.

The Central Intelligence Agency, which uses Notes extensively, intends to migrate to Notes DMS in the future since federal rules require use of the DSS, said Carl Schwab, CIA security manager.

The CIA at present makes extensive use of the RSA digital signature in Notes Version 3, requiring all mail documents to be signed digitally. The CIA's Notes system will automatically send back a message that is not signed.

Lotus has told the CIA it is building a "black box" for translating between Notes DMS and the commercial grade of Notes.

Cryptography expert Bruce Schneier, who heads the Chicago-based consultancy Counterpane Systems, said translation between encrypted data is technically possible.

Lotus said its DMS products have not been officially announced and declined to comment.

Until the past few weeks, Lotus was known to be only developing a version of cc:Mail under the DMS contract, but Lotus recently began briefing users and systems integrators on its Notes DMS plans.

Last week, several defense contractors confirmed the direction Lotus is taking with Notes DMS. Jeff Drake, director of North American sales at Enterprise Solutions, Ltd., the DMS X.400 backbone provider, confirmed Lotus intends to develop Notes DMS.

However, integrating Fortezza card encryption functions into Notes, which has relied on software-based RSA encryption to date, did not appear to be a simple task, Drake added.

The Defense Information Systems Agency, which is in charge of the DMS contract, said Notes DMS will be required to pass the compliance tests done at the Joint Interoperability Test Center in Fort Wuachuca, Ariz., on all DMS products.

DMS messaging is based on 1988 X.400 messaging, with extensions for the government's security requirements. Ironically, Lotus Notes Version 4, expected to be released by year-end, can also use X.400. But differences in the way Notes DMS and Notes 4.0 will implement security means the two groupware applications probably will be incompatible. ■

THE DEFENSE MESSAGE SYSTEM AT A GLANCE

What it is: A worldwide, X.400-based messaging system with X.500 directories designed to support 1 million military end users. DMS will use the Message Security Protocol APIs and Fortezza cryptocard for message encryption and digital signatures.

Contract awarded: May 1995

Winners: Loral, as prime contractor. Messaging vendors include Enterprise Solutions, Lotus and Microsoft.

GRAPHIC BY TERRI MITCHELL

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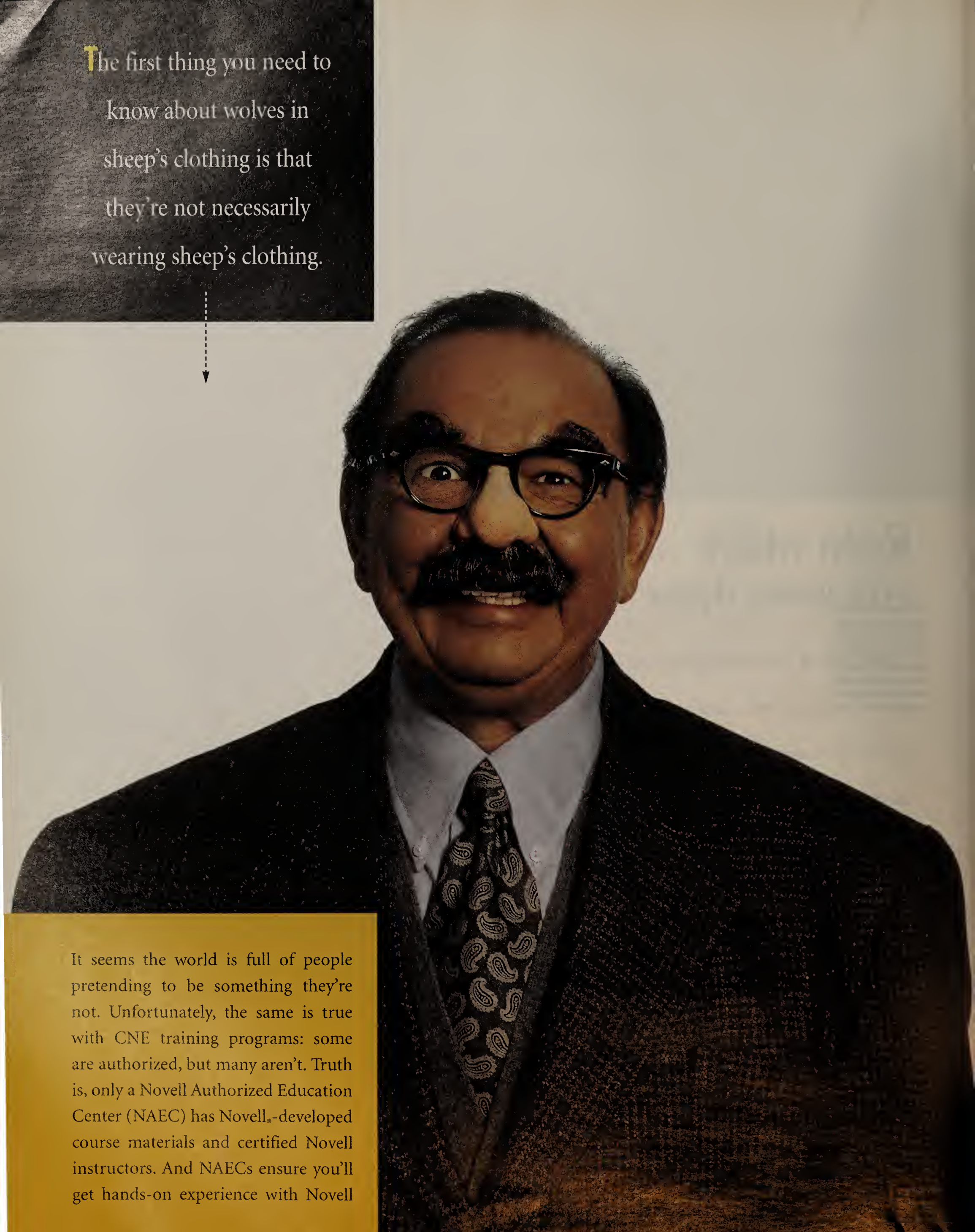

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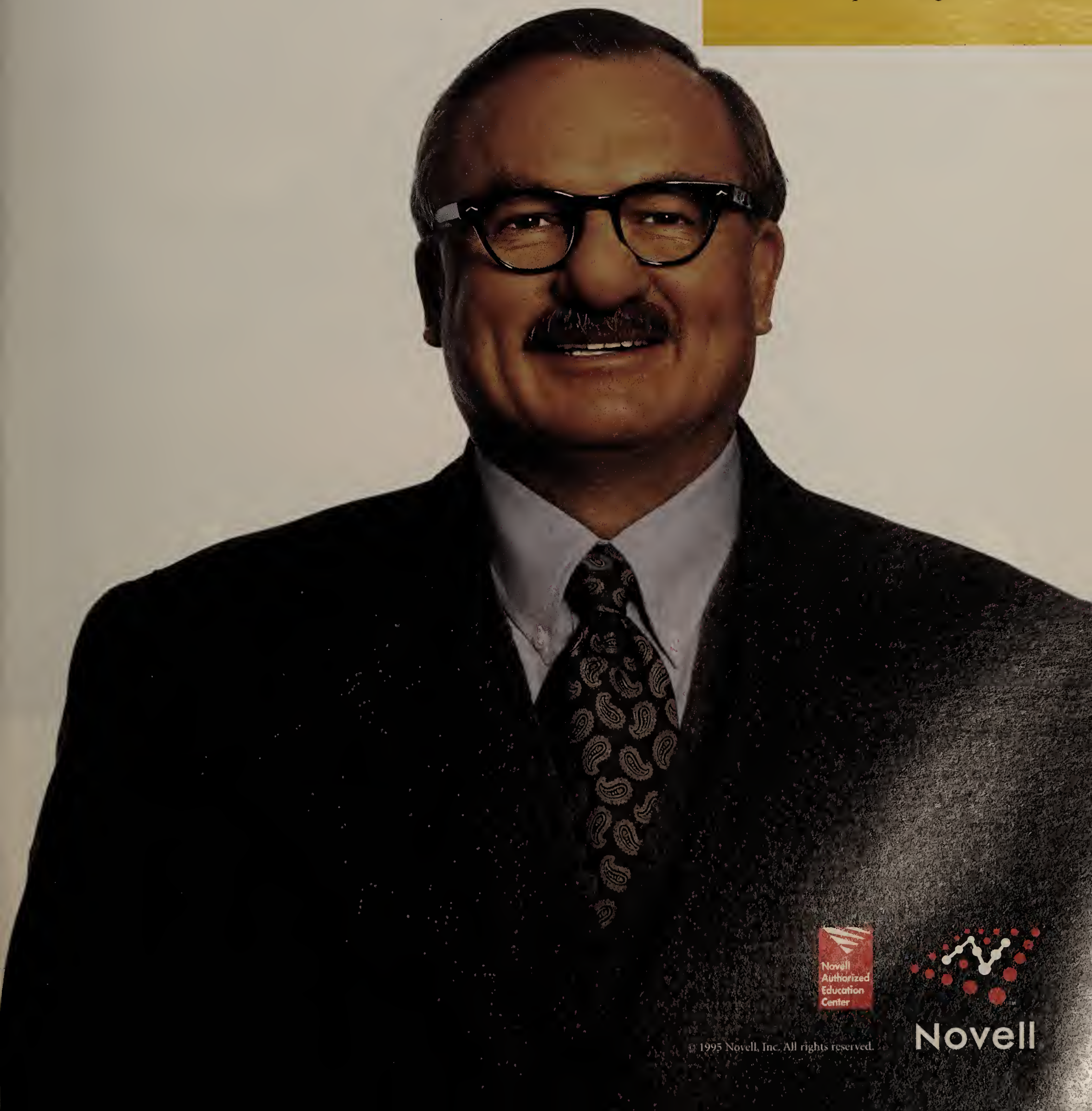

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Briefs

■ **Telebit Corp.** *last week lowered the price threshold for* **ISDN routers,** *with two IP-only versions costing under $1,000.*

The Telebit NetBlazer LS-1-1BS-IP and LS-2S/A-IP support IP dial-up routing over ISDN Basic Rate Interface lines. The LS-1 version includes integral ISDN, modem or leased-line connectivity, while the LS-2S version requires external access hardware.

Available now, the products cost $999 and $899, respectively.

Telebit: (800) 835-3248.

■ **SSDS, Inc.** *has rolled out a new management service that attempts to* **align business goals with technology** *purchase and implementation. Called EM ASAP, the service will provide a detailed report of current enterprise management practices and recommendations for future requirements.*

The report takes three weeks to research and costs $25,000, according to SSDS.

SSDS: (303) 790-0660.

■ **Sprint Corp.** *announced a service under which it will market,* **manage and deliver images** *from Eastman Kodak Co.'s digital Kodak Picture Exchange.*

Sprint initially will offer analog access over 14.4K to 28.8K bit/sec modems, useful only for preproduction images, according to a Sprint spokeswoman.

The service fulfills an agreement earlier this year by Sprint and Kodak to work together.

■ **MCI Communications Corp.** *and* **Microsoft Corp.** *last week said they have joined forces to provide direct access to* **NetworkMCI Conferencing services** *in future versions of the Windows operating system. Microsoft will work with MCI to develop software that allows users to register, reserve and use NetworkMCI Conferencing for multipoint conferences.*

Sprint pushes Nortel ATM switch to edge

Carrier promises ABR service, switched virtual circuits.

By Tim Greene and David Rhode
Kansas City, Mo.

Sprint Corp. says it will offer users of Asynchronous Transfer Mode two things they want most — available bit rate (ABR) service and switched virtual circuits (SVC) — but it will be 1997 before both are in place.

The carrier is installing Northern Telecom, Inc. Vector ATM edge switches in its network that will feed its backbone switches and give it the capabilities needed to supply ABR and SVCs.

Network World Fusion

Get definitions of ATM classes of service on Network World Fusion. From the main menu, select News+ then WANs and Internetworking.

While those features have been talked about by service providers and sought by users, the Sprint announcement last week reveals the gap between talk and reality.

The switches have the capability to enable ABR, SVCs and more, but Sprint is still working out how to handle billing for the switched services and developing an integrated network management system that will embrace the Vectors, according to Cathy Gadecki, Sprint's group manager for ATM services.

Using Fore Systems, Inc.'s Forethought software, the Vectors are also capable of delivering point-to-multipoint services, according to Tony Rbyczynski, director of strategic marketing for Nortel.

According to Gadecki, Sprint was considering whether to offer that service. "We have plans in place, but I'm not ready to talk about more," she said.

With the addition of the Vectors, Sprint's core switches — manufactured by NEC America, Inc. — will no longer terminate user traffic directly.

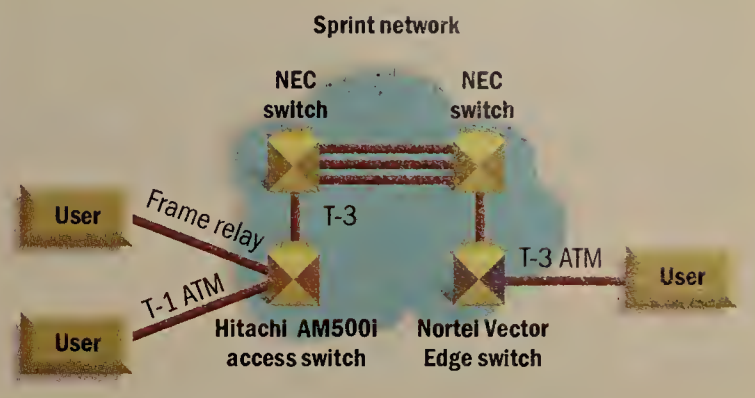
Instead, they will be used for fast transport of aggregated traffic through the core of the network, with the edge switches interfacing with user lines and delivering functionality and features, Gadecki said.

Those features include implementing signaling and congestion management standards set by the ATM Forum.

That will be crucial as ATM use increases, testing the capacity of the Sprint network. "We are starting to see the services move beyond the early adopter phase," she said.

Sprint at the edge

Putting a variety of ATM switches at the edge of its network lets Sprint offer services to more users.



GRAPHIC BY SUSAN J. CHAMPENY

So far, so good

Many of those early users have installed Fore premise equipment, and may find the presence of Vectors in Sprint's network comforting, according to Tom Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J. The Fore-Nortel

See **ATM switch,** *page 28*

Business users soon to download video at will

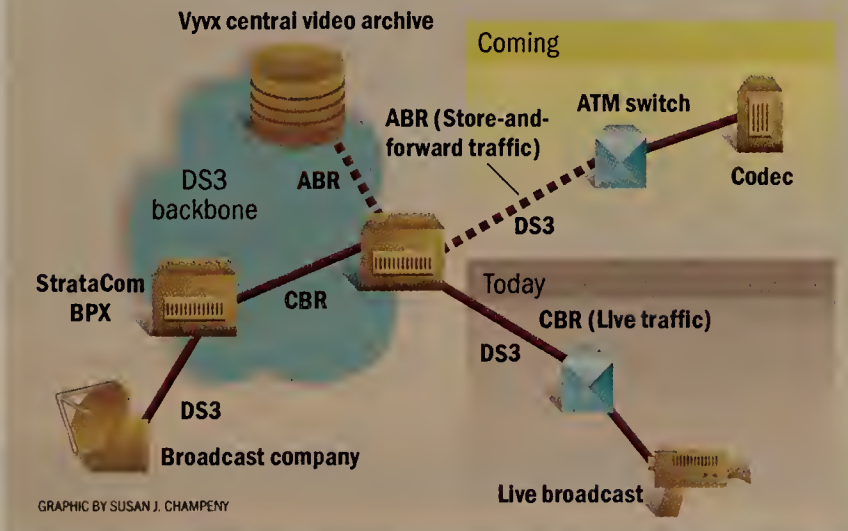
By Joanie Wexler
Tulsa, Okla.

Hoping to one-up the untamed Internet by delivering video across reliable, broadband links, a Williams Companies, Inc. firm is crafting an ATM-based service headed toward nationwide commercial availability by mid-1996.

Vyvx, Inc. is building a fiber-linked video server farm and intends to leverage Asynchronous Transfer Mode switches from StrataCom, Inc. to deliver the content to business customers, who can dial it up when they need it, said Miller Williams, vice president of corporate development and planning at WilTech Group, a Williams Companies subsidiary and Vyvx parent.

Versatile video

Vyvx will piggyback on-demand video traffic onto its existing network, which largely accommodates fixed-bandwidth, one-way broadcast applications.



GRAPHIC BY SUSAN J. CHAMPENY

The service, in pilot now, targets two types of customers: content suppliers, who will store their videos in the Vyvx central archive, and those who will "rent" the content.

Renters might be companies that want to download a broadcast-quality news clip or an on-demand training session and pay by the transaction, Williams explained.

"We will keep a record of who has accessed [a video file], provide the content owner with information on the customer and handle billing," Williams

See **Video,** *page 28*

Tivoli, HP pop mgmt. wares for Windows NT

By Jim Duffy

The move among systems management vendors to Windows NT continues to pick up, as Tivoli Systems, Inc. and Hewlett-Packard Co. have just announced products for the soon-to-be de facto standard operating system.

Tivoli ported its Tivoli Management Environment (TME) software to Windows NT and also rolled out an inventory management application that works with the operating system and an interface to Microsoft Corp.'s Systems Management Server (SMS) product.

For its part, HP unwrapped agent software that allows users to distribute software to Windows NT and Windows 95 clients and servers.

The new products from Tivoli and HP underscore the importance of Windows NT in the network and systems management arena. With Windows NT, users can now purchase management products for about half the cost of comparable Unix software.

For example, Digital Equipment Corp. recently announced a Windows NT version of Poly-

See **Mgmt. wares,** *page 30*

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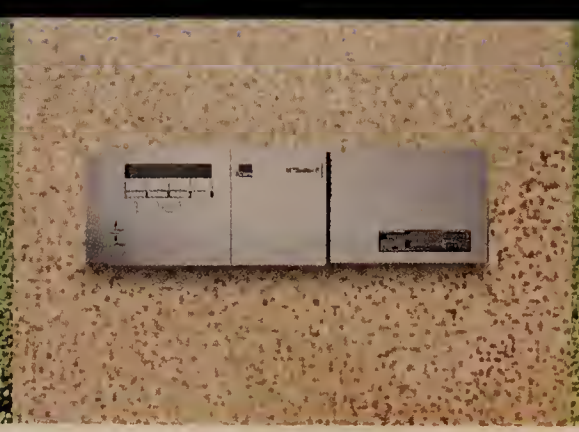

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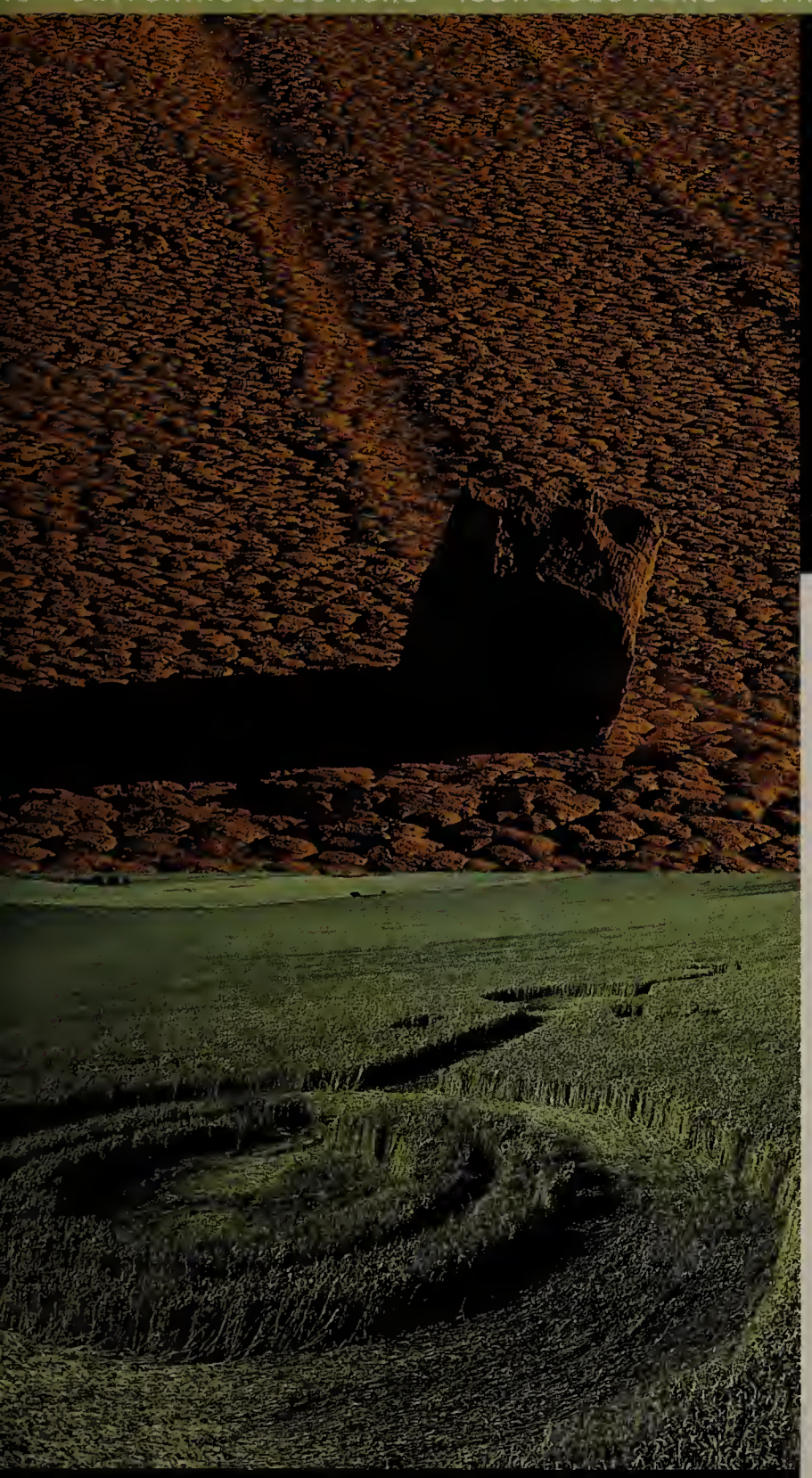

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INTERNETWORKING MONITOR

The Web: Not just for the Internet

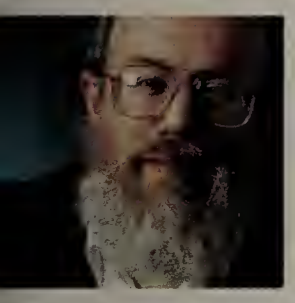
What happened to those key corporate networking technologies?

It seems like the up-and-coming, or at least muddling-along, technologies of DCE, client/server and PC-based query tools are beginning to fade before they even really get here. Instead, the Web seems to be taking over.

Web tools offer quite a bit now and promise to offer much more in the future. The most important reasons to use Web technology are:

- There are Web clients for a wide range of user platforms.
- Different clients are not required for different servers.

There is a booming market in Web browsers and even freeware that is available for almost any computer platform that can support a graphics screen.



Scott Bradner

As a comparison, it can be quite hard to get DCE support on all of the platforms that might be in use in a company. (Apple Computer being one of the companies that decided that it was better to not play than to play with someone else's ball.) Even where the DCE tools are available, it can be quite a task to develop client software for all of the platforms.

This has even led a number of companies to decide to ban systems that do not support DCE.

With a Web approach, the user does not need a different piece of client software to access each server, as is the case with most other access technologies. The browser used to access the home page for the latest Disney movie can also be used to register an IP address within the organization.

I have seen and heard about Web-based systems used to access personnel records, configure routers, update time cards, register IP addresses, look up phone numbers, interface to an SNMP management station, and even one to configure an X Window server. (Sort of like using a Coke machine to sell Pepsi.)

New Web features, such as Java downloadable routines, will increase the flexibility and potential of using Web technology in place of many others.

There are problems with this trend. Currently, the Web has no security standard. It will come in time, but until it arrives, it might not be a good idea to let professors update students' grades on the registrar's computer.

Knowing who someone is over a network connection always involves a bit of faith; however, it would be good to reduce the amount of faith required in certain cases.

Also, just as I do not think that any one networking technology will solve all of the networking needs of the world, I also do not think that any one interface technology is best for all applications.

The Web was not designed for some of the functions that would be best employed for some applications, like watching a real-time display of traffic flowing though a router. I've seen some rather ingenious contortions done to try and use Web technology instead of writing some special-purpose client program.

It does look like Web technology can be used productively within an organization for a range of applications. IBM might have been thinking of this when the company announced its MVS mainframe-based Web server, but you should not assume that all questions have the same answer.

Disclaimer: Harvard is in the business of creating and sometimes answering questions. Having just one answer would cut off half of the business. In any case, the above are my own opinions.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu. Bradner shares this space with Daniel Briere and Christine Heckart, whose column will appear next week.

Managed services

Disaster master Comdisco wants to man your WAN

By David Rohde
Rosemont, Ill.

The nation's No. 1 disaster recovery firm is using an acquisition to plunge into the crowded field of managed WAN services.

Comdisco, Inc. announced that it will acquire Minneapolis-based Netforce, Inc., a 5-year-old network services firm generally known as NetforceMTI, and use it to form the core of a new Comdisco Network Services unit.

Comdisco officials said the move will enable the company to satisfy demand among its current users for managed WANs.

But analysts said the new unit will face tough competition from the managed offerings of carriers and outsourcing and network integration firms.

"In order to compete with the big guys, they're going to have to greatly expand and invest," said Arnie Tomaino, senior industry analyst for network integration and support services at Dataquest, Inc. in Westborough, Mass.

Still, Comdisco officials hope to find a natural fit between disaster recovery and managed WANs in which the company would monitor customer premises equipment for faults and alarms but not actually operate the user's data center, as in outsourcing.

Comdisco officials hope to find a natural fit between disaster recovery and managed WANs.

The complexity of client/server networks makes it especially important for users to plan their wide-area architectures and disaster recovery at the same time, said Nick Pontikes, Comdisco executive vice president.

"It's difficult to build new distributed applications and then say, 'OK guys, now go out and recover this,' " he remarked.

Comdisco also has in place its own data network, dubbed CDRS Net and consisting largely of Synchronous Optical Network (SONET) rings in metropolitan areas, to supplement circuits leased from carriers for new WANs.

NetforceMTI plays to "customers' legacy of dissatisfaction with service from the carriers," said NetforceMTI President Mark Johnson, battling intense managed services competition under banners such as AT&T's AccuWAN and MCI Communications Corp.'s Integrated Client Services Division.

In the past 18 months, Johnson said, the company has focused on offering ongoing management of WANs for a fixed monthly cost with service-level agreements, as opposed to just up-front network design, product procurement, configuration and installation. The company's recent contracts have been predominantly for frame relay networks, he said.

NetforceMTI recently brought up a hybrid ISDN and frame relay network at 20 offices affiliated with Des Moines-based Iowa Realty Co. in three days, despite problems with key vendors Cisco Systems, Inc. and US WEST, Inc., according to Jeff Partee, a programmer/analyst with the real estate firm.

"I didn't have to babysit them for anything," he said. "They spent most of their time troubleshooting Cisco's problem, although I would have dropped [Cisco] right there."

NetforceMTI had to create a workaround for a problem with dial backup for the network's Cisco 2511 routers, though it required installation of modems, Partee said.

And the firm corrected US WEST's attempt at ISDN installation, according to Partee.

The telephone company originally installed only one 64K bit/sec bearer, or B, channel per interface rather than the standard two.

"US WEST doesn't know anything about ISDN," Partee said, echoing a familiar lament by users in the carrier's region. ■

A NetforceMTI to be reckoned with

Based	Minneapolis
Other offices	Chicago; Cleveland; Des Moines, Iowa; Washington, D.C.
Founded	1990
Employees	60
Fiscal-year 1995 revenue	$20 million
Ownership	Privately held until purchased by Comdisco
Primary business	Managed corporate WANs
Key transport technologies and services supported	Frame relay, X.25, ISDN, switched 56K bit/sec, Internet
Partners	Cisco, Bay, 3Com, HP, Windata

ATM, APPN mgmt. standards move along

By Michael Cooney
Raleigh, N.C.

Vendors at the APPN Implementers Workshop (AIW) recently pushed along a new specification that defines how SNA users can more easily migrate existing applications to an ATM environment.

At the AIW meeting here, vendors also continued to finalize features of:

- Advanced Peer-to-Peer Networking.
- High Performance Routing (HPR).
- IBM's Border Node specification for linking multiple APPN nets.

All of these are expected to be approved next year.

APPN

The specification for SNA migration to Asynchronous Transfer Mode, dubbed APPN/ATM Interworking, describes how IBM and other vendors will map their HPR class-of-service routing directly to ATM's Quality-of-Service specifications.

The ATM Interworking specification defines how APPN/HPR users can utilize APPN's class of service, which defines route security, transmission priority and bandwidth between session partners across an ATM net.

HPR is an extension of IBM's peer networking technology — APPN — and adds a number of improvements to APPN, including congestion control.

The specification would be implemented in code that would run on any device supporting HPR.

For IBM, that means extensions to VTAM, the software that controls mainframe communications, and other communications products.

For other vendors, such as Bay Networks, Inc. and Cisco Systems, Inc., the extensions would be made to their router software.

The AIW also announced that it would be working with the ATM Forum more closely as it develops its Multiprotocol Over ATM (MPOA) specification to ensure that APPN/HPR issues are addressed in its work.

IBM said its Border Node spec could receive the AIW stamp of approval early next year. Border Node, which is already supported in IBM's mainframe and Application System/400 products, lets users interconnect APPN nets to build larger ones. Vendors such as Cisco and 3Com have been urging IBM to release the specification so they can build support for it into their APPN products.

AIW participants, including Cisco, 3Com Corp. and Bay, are defining the multivendor development of APPN.

In other AIW activities:

- IBM is also offering to extend APPN functionality with a distributed discovery feature, which automatically registers devices on a token-ring LAN to the APPN directory found in APPN Network Nodes.
- Work continues on a proposal to extend the APPN directory services to include the registration of applications so users could locate and access resources across APPN nets. ■

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CALL CENTER OPERATIONS

Revised software streamlines operations at call centers

By David Rohde
Billerica, Mass.

A software vendor has come up with a way to harness enterprise networks to direct customer calls and associated data among multiple centers handling an organization's 800 phone calls.

Release 3 of Teloquent Communications Corp.'s Distributed Call Center (DCC) provides simultaneous voice and data rerouting without requiring dedicated facilities such as automatic call distributors (ACD) linked via T-1 lines.

The DCC software runs on a Unix-based workstation designated as a PhoneServer, which is connected to the public telephone network through an ISDN interface.

Instead of entering an ACD, calls arrive at the PhoneServer, which typically pops the call back out to the phone company's central office. The call is then directed to one of the company's available on-site agents equipped with a PC running the DCC Windows front-end software. To make this work, each agent PC must also be connected to the phone network through an ISDN interface, creating an ISDN equivalent to Centrex (see graphic).

The new release adds the ability to network multiple PhoneServers in a peer-to-peer configuration. The PhoneServers communicate using ISDN packets or, alternatively, over a packet-oriented enterprise WAN based on X.25, frame relay or another such technology.

With this setup, a caller does not have to wait for an agent to become available at the site that receives his call, said Jeff Fried, Teloquent's director of product management. The call can be routed to a free agent at a remote call center, he said.

Because of ISDN's signaling capability, the DCC software gives network administrators the flexibility to establish satellite call centers that do not need their own PhoneServers. "We use ISDN as an API to control the phone network," Fried said.

But the advantage of operating multiple PhoneServers in a peer configuration is that each can act as an arrival point for separate 800 telephone numbers while still potentially routing the call anywhere among the company's call center workforce.

These distributed arrival points (DARP), in Teloquent's terminology, can reduce the user company's 800 toll charges if the carrier charges according to mileage, Fried noted.

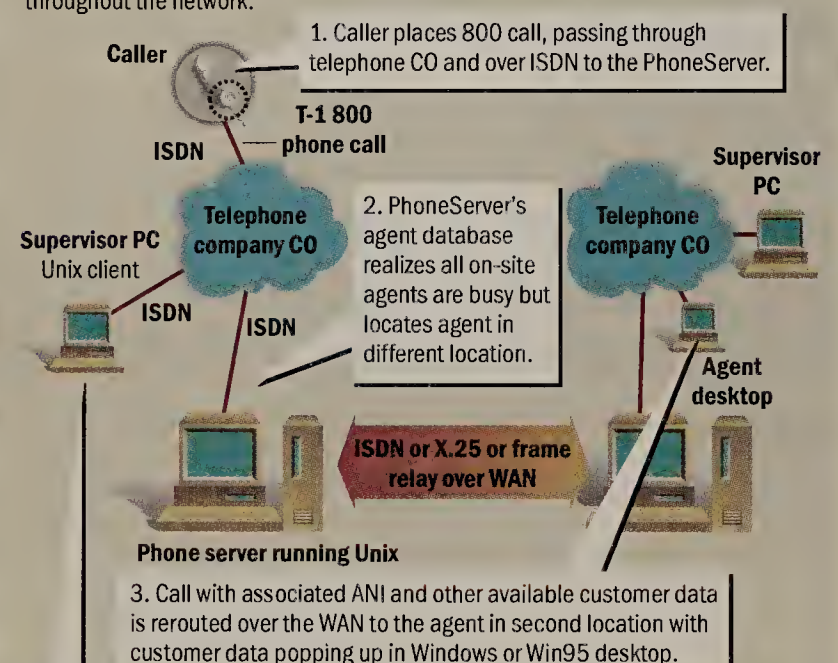
For users who prefer to load the DCC software on a single PhoneServer, Teloquent can also tweak the configuration so the supervisors' workstations at the satellite call centers contain a DARP feature.

DCC Release 3 is completing beta tests at two sites, including a division of Ameritech Corp. in Chicago. It is scheduled to ship by the end of the year. The system is priced at $2,500 to $3,000 per user, including integrated voice response.

©Teloquent: (508) 663-7570.

No dedicated links between call centers

Teloquent's Distributed Call Center can now operate in peer-to-peer fashion over multiple locations, with a supervisor in one location monitoring agent status throughout the network.



GRAPHIC BY SUSAN J. CHAMPENY

Users to paging companies: Clear out of 800

By David Rohde
Washington, D.C.

Seeking to head off government proposals to charge for rights to popular toll-free telephone numbers, a new user group is proposing that 800 numbers be reserved for critical marketing applications.

The proposal by the 800 Users Coalition would force paging companies — which have been chewing up 800 numbers by the tens of thousands — to put all their new customers in the new 888 toll-free area code, scheduled to debut March 1.

In a filing earlier this month at the Federal Communications Commission, the coalition said its proposal would help the public identify the type of call being placed by the telephone number — and avoid fights over similar-sounding toll-free numbers.

"Under this approach, the 800 [area code] would continue to be used for the call center, sales, customer service and technical support applications with which it is identified in the minds of the calling public," Colleen Boothby, an attorney here for the coalition, told the FCC.

Product information and product recall lines would also be entitled to use the popular 800 code, Boothby said. But paging would be shunted off to 888, and toll-free fax and data calls would be forced into 877 — the next anticipated toll-free code.

To avoid expected disputes

See **800,** *page 30*

Video

Continued from page 21

said. Vyvx is building the central archive with server and database technologies from IBM, Sun Microsystems, Inc. and Sybase, Inc.

"[Vyvx] will deliver broadband, uncompressed video with reliability guarantees," said Williams. "This is not available over the low-bandwidth, unmanaged Internet today."

The Vyvx backbone will start out at DS3 speeds and will be later upgraded to OC-3 and OC-12, according to Bunker Sessions, Vyvx's director of business development.

No ATM, no service

Vyvx needs ATM efficiencies to deliver the service. The company intends to piggyback the on-demand video traffic onto its one remaining fiber cable not sold to LDDS Communications, Inc. with subsidiary WilTel earlier this year, Sessions said.

ATM, heralded for peacefully supporting multiple types of traffic on one link, will allow Vyvx to run the constant bit rate traffic generated by existing customers on dedicated bandwidth alongside available bit rate (ABR) traffic generated by on-demand networking (see graphic).

The ABR class of ATM service allows traffic to use the network capacity that is available in the network at the time of a transmission, rather than nailing up a chunk of capacity to an application, explained Stan Kramer, director of public networks at StrataCom.

Companies accessing the Vyvx content service will require a piece of equipment on their premises with an ATM interface and a DS3 link from their local carrier. For that reason, the service may not be appealing from a cost perspective to applications other than the broadcast of recorded footage, said Steven Taylor, president of Distributed Networking Associates, a consulting firm in Greensboro, N.C.

Videotapes and overnight delivery could prove much less expensive for those applications.

However, for broadcast-quality news clip delivery, such a service would mean "you don't have to sit and constantly record everything that comes over the wire; you can download what you want," which could mean time and cost savings, Taylor said. ■

ATM switch

Continued from page 21

partnership to develop Vector essentially gives users of Fore premise equipment a single-vendor network even after traffic passes into the Sprint network, and that can mean optimized functionality. "Buying everything from one source is always the safest thing to do," Nolle said.

Vector will be the second type of ATM switch feeding Sprint's NEC backbone switches.

Hitachi, Ltd. ATM access switches already convert other types of traffic, such as frame relay, to ATM cells, and provide T-1 ATM interfaces for user access to the Sprint network.

Nolle said use of two types of switches at the edge of the carrier network will accommodate whatever kind of access early ATM users want, and give Sprint a shot at keeping them long-term.

Sprint is deploying 12 Vectors now and expects to bring up selected users on the network by the end of the year.

ABR enhancements to its T-1, T-3 and OC-3 ATM offerings will be available nationally during the second quarter of 1996. That will be in addition to its current constant bit rate offering.

SVCs, in compliance with the ATM Forum user network interface standard, are scheduled for sometime in 1997, according to Gadecki.

SVCs allow call-by-call connections so the user does not have to pay for a more expensive permanent circuit. That allows for setting up meshed networks less expensively.

Sprint officials said selected users are testing the new capabilities now but would not reveal who they are.

Use of the Vectors strengthens the relationship that has been growing this year among Fore, Nortel and Sprint. Fore and Nortel teamed up in January to produce the Vector switch, and Fore and Sprint have had a marketing arrangement that includes offering a Fore ATM user premise switch to access Sprint T-1 ATM service. ■

COMMENTS?

See "How to reach us" on page 5.

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NW1113

Caller ID catch-22 may delay national rollout

But 800 calls remain safe for CTI apps based on phone number.

By David Rohde
Washington, D.C.

A wave of interrelated problems appears likely to force the Federal Communications Commission to delay the scheduled Dec. 1 introduction of national caller ID or create multiple exceptions that could blunt its benefits.

National caller ID has been widely anticipated as a way to boost computer-telephone integration applications by making it possible to grab the telephone number of the calling party for use in a database lookup.

This is already possible on calls to 800 and 900 telephone numbers, which receive every calling party's number through automatic number identification, provided the user company has a dedicated access line. But under FCC and many state regulations, users calling non-800 numbers must be given an option to block their telephone numbers from passing through.

The fact that ANI cannot be blocked — but caller ID must include a blocking option — is creating technical headaches, according to petitions recently filed at the FCC by carriers.

For example, attorneys for Pacific Bell and GTE Telephone Operations first told the FCC that state law prohibits them from passing through caller ID until the state approves a customer education plan, so they will not be ready Dec. 1.

Then Sprint Corp. attorneys Leon Kestenbaum and H. Richard Juhnke alerted the FCC to a catch-22 situation. A quirk in Sprint's new switching software installed for national caller ID will pass through the telephone numbers of California callers anyway.

Kestenbaum and Juhnke explained that when the new switching software encounters a blank caller ID field — because a local carrier such as Pacific Bell does not provide it — it grabs the ANI instead and delivers it through in-band signaling.

Since callers are not given the opportunity to block the delivery of ANI, they said, this "would appear to violate at the least the spirit of the rules if the calling party has no ability to place a privacy indicator on the call."

National caller ID was originally due to go into effect on April 12 but was postponed to Dec. 1 following earlier disputes over the blocking rules and compensation for long-distance carriers, which, unlike regional Bell operating companies, generally do not earn caller ID revenue. ■

We're not ready

Carriers requesting delays in national caller ID or the related blocking rules, which are both due to take effect Dec. 1:

Carrier	Stated reason for delay	New start date requested
Ameritech	Conflict between FCC and state rules.	March 1, 1996
GTE	Problems in small central offices.	June 1997
Pacific Bell	California mandate for customer education.	June 1, 1996
SBC Communications	Problems with PBXs and payphones.	Indefinite
Sprint	Software problems in switches.	March 31, 1996
TDS Telecom	Small LECs need more time for upgrades.	Dec. 1, 1996

800

Continued from page 28

over so-called vanity 800 numbers, the FCC last month proposed offering users a right of first refusal for similar numbers in the 888 code, in exchange for a fee (*NW,* Oct. 16, page 10).

The coalition supported a right of first refusal but said a fee should only be charged to applications where just a few calls are made to any given number. Both the coalition and many carriers recently responding to the FCC's proposals opposed a separate idea to impose a refundable deposit for each toll-free number reserved.

Not all carriers were delighted with the idea of users getting special breaks at new numbers. For example, an official with fast-growing long-distance carrier LCI International, Inc. said users should have known before they invested huge amounts of advertising dollars that they do not own the telephone numbers they promote.

"Such customers should not be given a quasi ownership interest in their 800 numbers by according them a priority in selecting 888 numbers," wrote Douglas Kinkoph, LCI's director of regulatory and legislative affairs.

The FCC is expected to make a final ruling well in advance of the March 1 start date for the 888 code. ■

High price No. 1 cellular stumbling block

By Joanie Wexler
Las Vegas

The high price of cellular services is curbing corporate use and, in some cases, driving network managers to a different technology.

So said a focus group of eight wireless data network users at the recent Cellular Telecommunications Industry Association (CTIA) conference here.

The users, who identified themselves only by their first names and the type of organization they work for, unanimously agreed that price is crimping their style.

Cellular prices — which run about four times that of well-negotiated land-line charges — caused the IS director for a municipality to install a private 800-MHz FM radio system. Instead of using cellular network services, she needed to hook a new building in a high-traffic part of town to the corporate network.

The reason for choosing 800-MHz radio: Comparative prices of cellular vs. FM radio "were not even close."

Another municipality IS director said price did not keep him from investing in cellular service and equipment initially, but it does restrict how much his organization uses the network.

In addition, carriers "need to get away from metered charges," he said, because they make budgeting too difficult.

There was disagreement among the users as to how much of a premium they will pay for the mobility afforded by wireless nets.

Some said they want prices on a par with wire-line rates, while others said they would pay a full 100% more, depending on the criticality of their application.

"I'll pay top dollar, but give me 100% service," said one participant.

That user said he found out about Cellular Digital Packet Data (CDPD), a digital overlay to the analog cellular network, at an industry conference and was hooked. He called up his local carrier to buy it, he said, "and the rep replied, 'What's CDPD?' "

The industry is "way behind in CDPD," acknowledged Dennis Strigl, president of Bell Atlantic NYNEX Mobile, incoming CTIA chairman and a focus group moderator.

He said his company is investing $60,000 to $80,000 per cell site to CDPD-enable it. There are 15,000 to 18,000 total cell sites in the U.S., all of which, theoretically, must be CDPD-equipped before the technology can claim the ubiquity of the analog net. ■

Mgmt. wares

Continued from page 21

center Manager on NetView for about $7,000. The Unix version of this product costs $15,000.

"We will by the end of the year probably have 5,000 to 6,000 [Windows NT] workstations deployed," said Dave Kessell, vice president of infrastructure projects at Charles Schwab & Company, Inc. in San Francisco. "In terms of architecture, direction and trying to get overall integrated support that can handle multiple environments, we think [TME for Windows NT] is very much the right direction."

More than NT promises

Tivoli and HP have these management products on the way:

Tivoli

- TME for Windows NT
- Tivoli/Inventory 3.0
- Tivoli/Plus for Microsoft SMS

HP

- OpenView Software Distributor agents for NT and Windows 95

TME for Windows NT provides a unified view as well as consolidated operation for Windows NT, Unix, NetWare and Windows 95 clients and servers. Multiple management operations that span those operating environments can be combined into a single task, Tivoli said.

The new inventory management application, Tivoli/Inventory, is based on technology licensed from Intel Corp. and complies with Desktop Management Task Force specifications (*NW,* Oct. 2, page 10). Tivoli/Inventory can be launched from a TME console to discover and document hardware and software configurations on PC and Unix systems, including Windows NT.

In addition, Tivoli rolled out Tivoli/Plus for SMS, software that links TME with Microsoft's inventory and configuration management software for Windows and Windows NT environments. With the integration, TME users can access inventory data on SMS-managed systems and distribute software to them.

TME for Windows NT costs $500 to $1,700 per server and will be available in January. Tivoli/Inventory costs $150 and will be available in the first quarter of 1996. Tivoli/Plus for Microsoft SMS also costs $150 and will ship in February.

Meanwhile, HP announced OpenView Software Distributor 1.01, which includes agents for Windows NT and Windows 95 systems. Version 1.01 lets users distribute software to PCs and Unix workstations from a central OpenView console, HP said.

OpenView Software Distributor 1.01 costs $2,250 and is slated to ship in January.

©Tivoli: (512) 794-9070; HP: (800) 752-0900.

BusinessBriefs

Two second-tier interexchange carriers have bulked up through new acquisitions of smaller carriers and resellers. No. 6 carrier **LCI International, Inc.** said it will acquire **Teledial America, Inc.** of Grand Rapids, Mich., which does business under the name **US Signal.** No. 8 carrier **Midcom Communications, Inc.** will acquire **Telco Communications Group, Inc.** of Chantilly, Va., which does business under the names **Dial & Save** and **The Long Distance Wholesale Club.**

The **Federal Communications Commission** has joined with telephone switch vendors and state regulators in a public awareness campaign about new area codes, featuring full-page ads in *The Wall Street Journal* and elsewhere. In a statement launching the campaign, FCC Chairman Reed Hundt begged owners of public and private telephone equipment to update their switches.

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Briefs

COMDEX

■ **Novell, Inc.** *plans to demonstrate at Comdex/Fall '95 this week a model it hopes customers will use to build* **internal corporate World-Wide Web sites** *linked to NetWare LANs.*

The prototype uses a series of Novell products, including NetWare 4.1, the just-announced NetWare Web Server, the LAN Workplace TCP/IP stack and Internet applets such as the GroupWise electronic mail system. The prototype is based on Inner Web, Novell's internal Web site, which is under construction.

■ **IBM** *is adding TCP/IP administration and backup services to its* **OS/2 Warp Server,** *which is in beta and scheduled for release in first-quarter 1996.*

The TCP/IP features, called Dynamic AP, include support for Dynamic Host Configuration Protocol (DHCP) and Dynamic Domain Name System (DNS). DHCP gives net managers a central repository for net configuration data, including IP addresses. Dynamic DNS lets each LAN client automatically maintain host name data, including DHCP addresses, so the net manager does not need to do it manually.

IBM: (800) 426-3333.

Software serves up the Web for NetWare

This quarter's examination of hot LAN tools describes two products for implementing Web servers in NetWare.

By Mark Gibbs

With so many companies planning to build private World-Wide Web sites as low-cost, easy-to-support internal information distribution systems, vendors have begun developing Web server software for Novell, Inc. NetWare LANs.

Actually, it is surprising that, until recently, only one source offered a Web server implementation for NetWare. This product, called GLACI-HTTPD Web Server for Novell NetWare, is from the Great Lakes Area Commercial Internet.

GLACI-HTTPD is a NetWare Loadable Module (NLM) that runs under NetWare 3.X and 4.X and provides a basic HyperText Transport Protocol (HTTP) server implementation over TCP/IP. (The D in HTTPD stands for daemon, which is the Unix term used for server-resident processes.)

Network managers can download the current version of the software from the GLACI Web site A http://www.glaci.com A as a free beta release. This software stops working after a predetermined termination date.

Net managers easily can install GLACI-HTTPD via a utility NLM that GLACI supplies. By default, the software falls under the SYS:SYSTEM subdirectory. Likewise, all Web documents and images are stored by default in subdirectories under SYS:ETC.

The installation utility is basic but well mannered: Unlike a lot of third-party NetWare packages, it asks you to confirm each directory that needs to be created. On

See **Hot products,** *page 9L*

Hot NetWare-based Web servers

Vendor:	Great Lakes Area Commercial Internet of Wauwatosa, Wis. (414) 475-6388
Product:	GLACI-HTTPD for NetWare
Platform support:	NetWare 3.X and 4.X
Pricing:	$295 per unit for between one and four servers; $95 per unit for 100 or more servers
Pro:	Inexpensive and practical
Con:	Limited functionality
Vendor:	Electronic Dimensions of Canberra City, Australia 61 18 622 386
Product:	Webware
Platform support:	NetWare 3.X and 4.X
Pricing:	Free for 30-day trial of Webware Demo; $999 for Webware Lite; $2,500 for Webware Commercial; custom pricing for Webware Enterprise
Pro:	Well designed, with strong development plan
Con:	New in the market and a little expensive

3Com to add more than just token support for switching

FOLLOW UP

By Michael Csenger
Santa Clara, Calif.

As expected, 3Com Corp. this week will fill in details on its token-ring product plans, which include delivery of a 12-port switch next spring for under $700 per port (*NW,* Nov. 6, page 1).

3Com's LinkSwitch 2000TR will be a stackable device for workgroups and data centers, and will derive enhanced management and performance features from a pair of custom Application Specific Integrated Circuits that 3Com developed internally.

Other token-ring products are also being discussed by 3Com this week, including a 10% price cut and enhanced features for the NetBuilder Remote Office SuperStack routers, which provide connectivity to remote offices. In addition, two new token-ring adapter cards for ISA and PCI buses will be available in December.

One of only a few

But the LinkSwitch 2000TR is the most interesting effort under way since there are only a handful of token-ring switches on the market so far. To date, Ethernet switching has stolen the show, and 3Com has been among the players with its LinkSwitch 1000 workgroup switch.

3Com's token-ring offering will boast a handful of features, including virtual LAN capabilities. The switch's 12 ports can each support one of 16 different virtual workgroup identifiers, short tags added to each data packet that identify the workgroup to which

See **3Com,** *page 8L*

Compaq boosts NetWorth through acquisition

PC and server giant broadens product offerings with fast Ethernet switches and hubs.

By Jodi Cohen
Houston

Compaq Computer Corp. last week announced that it has agreed to acquire fast Ethernet hub and switch maker NetWorth, Inc. for $372 million — the computer company's second such buyout of a networking firm this fall.

Compaq's foray into the 100Base-T hub and switch space came as no surprise to industry observers, who speculated about just such a deal when Compaq revealed plans to buy Thomas-Conrad Corp. last month (*NW,* Oct. 23, page 6).

Does Compaq know networking? Page 16L.

Both acquisitions, along with Compaq's partnership with router and switch giant Cisco Systems, Inc., signal the PC and server maker's desire to play a bigger role in the internetworking arena.

The NetWorth deal provides Compaq with an Ethernet complement to Thomas-Conrad, which has its expertise in token-ring and 100VG-AnyLAN technology.

Under terms of its agreement with NetWorth — which posted revenue last year of $55 million — the hub maker will become Compaq's new hub division. NetWorth President and Chief Executive Officer John McHale will become a Compaq corporate vice president.

See **Compaq,** *page 5L*

COMPAQ KEEPS ON COLLECTING

Buying NetWorth gives the computer company the following technology:

Hubs
- Series 2000 snappable workgroup hubs
- Series 3000 trisegment stackable hubs
- Series 4000 and 6000 10-slot modular hub chassis with Ethernet, token-ring and fiber repeater modules
- FastStack 12-port stackable 100Base-T repeater hub
- MicroHub nine-port Ethernet repeater
- Micro100 eight- and 12-port 100Base-T unmanaged repeater hub
- Micro10/100 24-port 10M/100M bit/sec unmanaged repeater hub

Switches
- FastPipes six- and 12-port 10M/100M bit/sec switching hubs

Network management
- HubView Windows-based Simple Network Management Protocol platform

Network interface cards
- SwiftNIC 10M/100M bit/sec PCI, EISA and ISA network adapters
- Ethernet cards for EISA, PCI and Micro Channel buses
- Token-ring adapter cards

Novell's chief technology officer gets the company on right track

Corporate IT veteran Sheldon Laube provides an all-important user perspective.

By Dawn Bushaus

Sheldon Laube, chief technology officer at Novell, Inc., understands what users want. He knows because he was a customer himself for nearly 10 years as director of information technology at accounting firm Price Waterhouse.

Now Laube is busy reshaping Novell's corporate strategy to make it match users' real needs. He wants the company to focus on providing network integration services — a direction that has been a long time coming, according to industry watchers.

"For quite some time, Novell had gotten away from its core competencies and the needs of the market and focused instead on duplicating Microsoft's strengths," said Jamie Lewis, president of The Burton Group, a Salt Lake City-based consulting company. "It headed into a battle with Microsoft that it could not win."

Lewis credits Laube, at least in part, with what he calls Novell's "fundamental course correction." This strategic shift became apparent in September, when the company announced plans to strengthen and extend the NetWare platform (*NW*, Sept. 25, page 1).

Novell wants to enhance NetWare with a wide range of new services aimed at helping customers integrate disparate computer systems. Toward that end, the company has decided to license the network operating system. This move essentially will extend the NetWare environment to support many application platforms, including IBM's OS/2, Microsoft Corp.'s Windows NT and a variety of Unix systems.

Telling hire

"With Laube, Novell has got someone with a lot of experience who understands why people buy technology and how they use it," said Lewis, adding that Laube's hiring marked the beginning of Novell's strategic change.

"For the past three or four years, Novell hasn't had anyone with vision and authority," Lewis explained. "That caused a lot of conflict between Novell's product groups."

Laube joined Novell six months ago to fill the newly created position of executive vice president and chief technology officer. Since then, he has been working with other Novell executives to develop and implement the company's new strategy.

Of like minds

"We've tried to give people a clear vision of what pervasive computing means and what its benefits are," Laube said in a recent interview with *Network World*. "We've tried to lay out a clear road map of the products we intend to deliver."

Pervasive computing — the ability to communicate with anyone, anywhere, at anytime — was a goal Laube shared with Novell long before he joined the firm.

Novell's Laube *is credited with his firm's 'fundamental course correction.'*

"I have always been attracted by the vision of pervasive computing," Laube said. "In the simplest sense, pervasive computing talks about how you allow people to connect up wherever they are anywhere in the world. My own vision is very consistent with that."

You can get to a pervasive computing environment in one of two ways: You make computers cheaper and easier to use or you do away with them entirely and embed the technology in everyday objects, Laube said.

He predicted that both will happen.

"To me, it kind of comes home with my mother, who is 80 years old," Laube said. "She's not going to learn to use a computer anytime soon.

"But we bought her a microwave that has a computer in it that helps set the proper cooking time. That really is valuable to her, and she can benefit from what computers can do without ever having to know how to use a computer."

Divine intervention?

Novell's customers want to see pervasive computing become a reality, Laube said. They want diversity in their computing environments.

"Customers' computing environments are not going to be simply Windows NT, or simply Unix or simply Windows 95," Laube said. "In the real world, there is usually a sprinkling of each, and customers need a way of administering and managing them — a way of seeing a logical whole as opposed to all of these disparate systems."

See **Laube,** *page 14L*

J&L serves up winning remote access gear

By Mark Gibbs

Any network manager who has tried to link field workers and other off-site personnel to corporate LANs will tell you that problems and complexity abound when it comes to remote access.

Reliability, performance and manageability problems dog most implementations. The bigger the dial-up access system, the greater the troubles.

But over the past few years, a small group of remote access vendors have emerged with solutions on which users can count. Among them is J&L Information Systems, a Chatsworth, Calif., company known for its ChatterBox family of dial-in remote access systems.

Since its founding in 1982, J&L has focused on the Novell, Inc. market, with support for NetWare and remote client operating systems such as Microsoft Corp. Windows. The company recently has expanded that support to other operating systems, such as Windows NT, Unix and IBM's OS/2, on its remote access servers.

This broadened focus seems to be attracting an equally diverse audience. Among J&L's customers are the Internal Revenue Service, the U.S. Postal Service, the National Park Service, the Federal Emergency Management Agency and Deloitte & Touche.

Patented approach

At the heart of J&L's products are custom hardware, a specially engineered version of Symantec Corp.'s pcAnywhere remote access package and a number of patented technologies for maintaining the integrity of remote access systems.

The first of J&L's patented techniques simply reboots each processor as soon as the remote client disconnects. This prevents a board that may be logged into a network server as a registered user from being accessed through a subsequent incoming remote connection. The technique senses when the modem attached to a board drops the DSR or DCD lines.

The second patent is for the simple technique of "busying-out" the modem during the hard reset. This ensures that the board cannot be accessed during that procedure.

Another important reliability and management feature is autodetection of board lockups. The lockup detection is done in hardware and automatically reboots the board. Net administrators also can initiate this feature remotely across the network via Simple Network Management Protocol or directly over a dial-in connection through J&L's ChatView management software.

Systems and integration

For its remote access products, J&L uses internally designed hardware and single-board computers from Intel Corp. The company reengineers the Intel boards to its own specifications and integrates them with its system hardware and software. This lets J&L quickly adopt new processor technologies and easily upgrade existing systems.

The single-board computers, which J&L calls E-Z Swap Processing Units, feature integral disks and controllers, an ISA slot for network cards up to three-quarter length and an optional extender card that has two ISA slots.

PCI slots are available on new Pentium-based boards. Processor modules include a broad range of 386, 486 and Pentium processors, which can be mixed and upgraded when needed.

Common denominators

In addition, J&L recently launched a line of lower priced boards called ChatExpress/486. These are available with a variety of 486 processors.

All of J&L's boards have parallel and high-speed serial ports, and connectors that allow users to share a floppy drive. In addition, all boards support Super VGA displays.

Perhaps the most important attribute of these boards is that they are hot-swappable. In the event of a hardware failure, a board can be replaced without downing the entire system.

Similarly, as many as four

See **J&L,** *page 7L*

The basics

- **Company:** J&L Information Systems
- **Location:** Chatsworth, Calif.
- **Phone:** (800) 456-1333
- **History:** Founded in 1982 as a division of Astro Sciences Corp.
- **Revenue:** $14.96 million net sales for the year ended March 31, 1995
- **Key executives:** George Lazik, president; Rex Jackson, senior vice president; Keith Murphy, director of marketing
- **Products:** A variety of remote access devices
- **Customers:** Internal Revenue Service, the Postal Service, the National Park Service, the Federal Emergency Management Agency and Deloitte & Touche

The chat line

J&L Information Systems offers a variety of remote access products, including:

Product	Price
ChatExpress 66-MHz 486DX2 Processor Unit with 8M bytes of RAM	$1,475
ChatExpress 90-MHz Pentium Processor Unit with 16M bytes of RAM	$2,715
ChatterBox/NRS T-10 cabinet without processor boards	$2,195
ChatAccess/2E with two WAN ports	$1,695
ChatAccess/4E with four WAN ports	$2,495
ChatAccess/8E with eight WAN ports	$3,495

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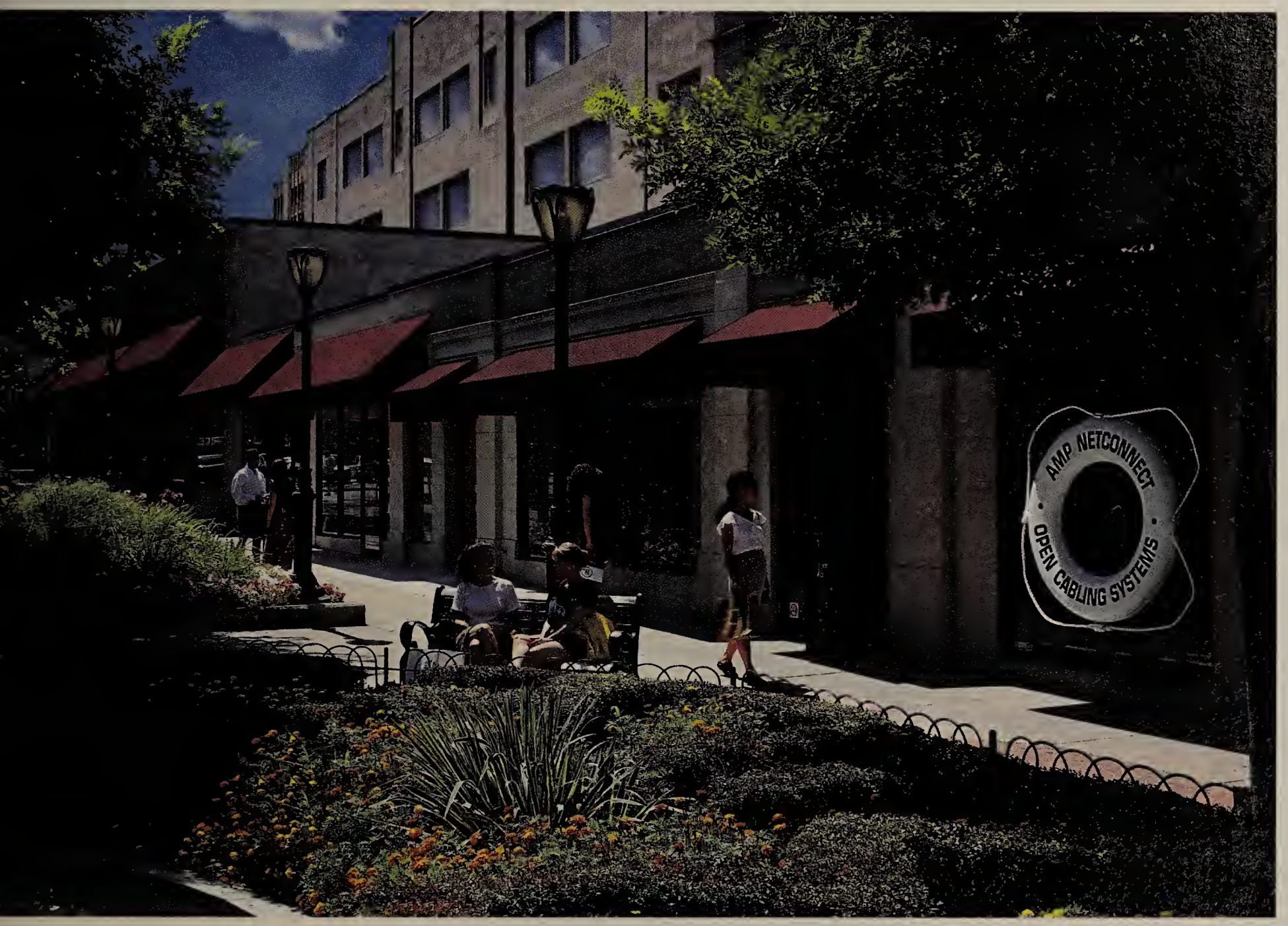

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AMP

DMI shortcomings lead to DMTF defection

An IBM-led team forges plan for developing common agent management technology for use on desktop devices.

By Paul Korzeniowski

Users desiring network management consistency at the desktop face one disappointment after another as vendor consortiums repeatedly splinter, rather than deliver a single set of specifications.

The latest split came within the Desktop Management Task Force (DMTF). It arose from limitations with the group's Desktop Management Initiative (DMI) specification, which is designed to gather management information from desktop applications and devices such as adapter cards. The first cut at DMI outlines what management information can be collected, but it does not specify how to carry that data.

Vendors have begun jockeying to fill that void. A team comprising representatives from Apple Computer, Inc., IBM, Ki Networks, Inc. and Sun Microsystems, Inc. was the first horse out of the gate.

In September, the companies announced plans to incorporate common agent technology in their products.

No one debates the need for the fill-in work. Currently, users must install management agent software, which can require from 3K to 15K bytes of RAM, for each desktop component. As the number of components increases, the amount of memory left to run user applications diminishes.

Weaving in DMI

So corporations are left with the unappealing option of adding more memory to desktop systems or limiting management functions. The LAN manager at Firestone Textiles, Inc. in Woodstock, Ontario, faces such a choice.

The company has 200 users equipped with Windows-based PCs connected to Novell, Inc. NetWare 3.1.1 servers.

The textile company, which relies on Intel Corp.'s LANDesk network management system to control its network, bought Intel DMI-compliant adapter cards earlier this year. Glenn Farrell, the LAN systems coordinator at Firestone Textiles, said he would like to add other DMI-compliant devices but has encountered two problems.

First of all, few DMI-compliant products are shipping. Second, the management features needed for each component might require too much RAM, Farrell said.

Memory has become a key consideration because the firm is contemplating a move to Windows 95. "We know Windows 95 needs a lot of RAM, and we need to ensure that users will be able to run their applications," he said.

Support for a common agent could help Farrell. It would let him install one piece of software that would collect management data from all components. The software's RAM requirement would likely fall into the 3K- to 15K-byte range.

Beyond common agents

While acknowledging the need for common agents, vendors within the DMTF disagree on how to move management information from a desktop to a central management console. IBM and its team members said they believe the Simple Network Management Protocol is the most immediate answer.

IBM developed software that maps DMI data to SNMP, which is used by net management platforms such as Hewlett-Packard Co.'s OpenView, IBM's NetView for AIX and Sun's SunNet Manager.

"We focused on SNMP because it has emerged as the dominant method of collecting different types of management data," said Lee Cole, manager of SystemView Technology at IBM's Network Software Division in Research Triangle Park, N.C.

SNMP is just one of three possible ways to transport DMI data, according to Ed Arrington, DMTF chairman. A second method is to use the remote procedure call (RPC) found in the Open Software Foundation, Inc.'s Distributed Computing Environment (DCE). The third method is to use an application-specific RPC.

The DMTF originally passed on selecting a transport standard, which it dubbed Remote DMI (RDMI). But when holes in the initial specification become apparent, the group began examining RDMI alternatives during the summer with an eye toward completing a standard by year-end, Arrington said.

While acknowledging the need for common agents, vendors within the DMTF disagree on how to move management information from a desktop to a central management console.

A few vendors are waiting for the task force's decision. "Users buying products conforming to the IBM common agent specifications should be aware that no standards body has blessed that work. When the DMTF standard arrives, it may look much different than IBM's work," said Gordon MacKinney, OpenView program manager at HP in Fort Collins, Colo.

IBM counters that its common agent architecture is open to all parties. In addition, Cole said, the company plans to enhance it to run on other transport protocols, such as the Object Management Group's Common Object Request Broker Architecture.

Another direction

IBM is not the only DMTF supporter veering in a proprietary direction. Microsoft Corp., a founding member, also has diverged from the group's work.

DMI comprises four specifications: Component Interface (CI), Management Information Format (MIF), Management Interface (MI) and Service Layer (SL). The SL uses the CI to collect device information, which is then stored in a MIF database. Network management applications summon that information via the MI.

Microsoft is examining how to support the MI but has no plans to adopt the SL or CI, which deal with operating system-specific management information, according to Phil Holden, a product manager at the company.

When Microsoft unveiled its Systems Management Server, it outlined a proprietary architecture, dubbed Plug and Play, that is functionally equivalent to SL and CI. Because Windows 95 already includes integrated management interfaces adopted by third parties, Microsoft determined that there was no need to incorporate CI or SL support in its operating system.

However, not all vendors agree with Microsoft's point. "Microsoft is playing a coy game. The company has given a perfunctory nod to DMI while focusing on proprietary management tools," said HP's MacKinney.

Because of Microsoft's decision, vendors have to write to the DMI as well as Plug-and-Play interfaces.

"Companies may need to use Plug-and-Play to access Windows management information and DMI to gather information from other operating systems," said Rick Villars, director of network management research at International Data Corp., a Framingham, Mass., market research firm.

Yet Microsoft has not totally turned its back on the DMTF. It expects to back the group's RDMI specification, Holden said. He added that Microsoft anticipates that the task force will select DCE, which it has been incorporating in its management products as the remote management transport.

"SNMP appears to be only a short-term fix to remote management transport issues. DCE offers a more robust set of services," Holden said.

DCE does possess attractive desktop management features. While SNMP has been great for collecting network device information, the protocol is not as well suited to systems management. Because SNMP is a polling function, it can add overhead to a network. And since DCE relies on an RPC, there is no overhead.

Consequently, DMTF supporters may adopt two transports rather than one. The IBM lead group will push SNMP, and a second camp — which includes Microsoft — may adopt DCE.

Better than nothing

Despite the divergence, the DMTF has helped to limit the number of net management interfaces. Before DMI, vendors relied on proprietary interfaces to gather or send management information. That hodgepodge of interfaces has been narrowed to a couple of options.

Support for DMI has risen. The number of vendors offering DMI-compliant products has swelled to 127, up from only 25 companies in the beginning of the year, according to Arrington.

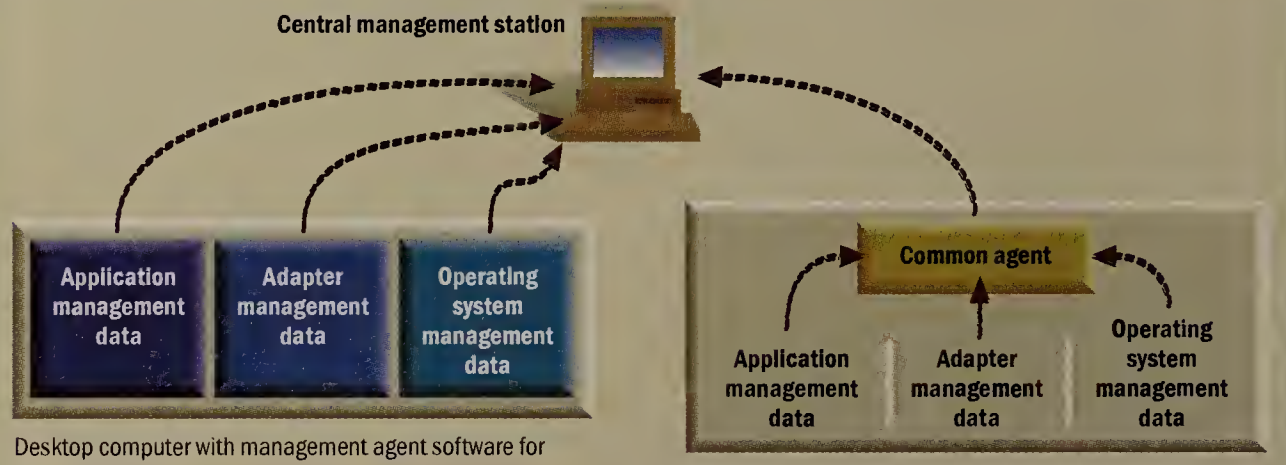
But the group's work probably will fall short of the utopian ideal of selecting single interfaces that all vendors will support. "Users would like to see more commonality among vendor products, but vendors have differing views concerning the best ways to solve customer problems," MacKinney said.

Ultimately, users will determine which vendors offer the best options.

Korzeniowski is a freelance writer in Malden, Mass., specializing in networking issues.

A common denominator

Common agent technology will eliminate the need for memory-consuming management software for each desktop component and will simplify the interface with the central manager.



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J&L

Continued from page 2L

power supplies can be ganged and hot-swapped as required.

J&L's rack-and-board designs allow for a high processor-to-footprint ratio. The Network Resource Sharing (NRS) racks range from a tower-size model that holds up to four boards to a 7-foot enclosure that accommodates as many as 56 boards. These are called the ChatterBox/NRS T-4 and ChatterBox/NRS RB, respectively.

Those organizations that really want to take processor density to the limit can do so with J&L's newly announced, two-processor ChatVantage/486 board. Now a single ChatterBox/NRS RB can hold a total of 112 processors.

Farming and processing

Although J&L specializes in remote access servers, the high processor density of its systems offers an interesting edge to organizations that need large numbers of processors for application or network servers. They can use the systems to build server farms.

For example, Oracle Corp. of Redwood City, Calif., uses a J&L system with four Pentium-based boards for building its System 7 database product. Build time is down to four hours from the 12 to 24 hours it used to take using stand-alone computers. What's more, the entire configuration is now portable.

Based on these positive results, Oracle has ordered another J&L system with eight processors.

Management and control

Another important attribute of the J&L systems is the separate management processor, called Intelli-Management. It provides smart management features such as preset alarms and performance monitoring for an entire multiple-board system.

In the event of a processor lockup, Intelli-Management forces the board to reboot. Integrated with J&L's ChatView/SNMP for reporting and diagnostics, Intelli-Management reduces the amount of human intervention required to a minimum.

ChatView/SNMP is an enhancement of the ChatView server management software J&L bundles with all of its systems. With ChatView, the net administrator can monitor each processing unit, gather statistics and reset hardware from anywhere on the network.

With SNMP support, ChatView can be integrated into an enterprise network management system. What's more, ChatView/SNMP is designed as an extension module for Novell's NetWare Management System.

ChatView's management console is implemented as a DOS and a Windows application, as well as a NetWare Loadable Module. This allows all management functions to be effective from anywhere on the network.

New product line

To round out its remote access offerings, J&L has a new remote-node server line called ChatAccess. The remote node servers are licensed versions of LAN Access Corp.'s LANAserver products.

The ChatAccess products are dial-in-only Reduced Instruction Set Computing-based servers with an Ethernet port. They are available in two-, four- and eight-port models. ChatAccess servers and client software support a variety of protocols, including IPX/SPX, NETBEUI, NETBIOS, DEC, TCP/IP and AppleTalk, at data rates of up to 230K bit/sec with Password Authentication Protocol and Challenge Handshake Authentication Protocol.

J&L's future plans include complete out-of-band server logging, which is the ability to monitor and control boards at a low level, across the network or via dial-in and extensions to its non-system-intrusive diagnostics.

While J&L's systems carry a premium price A they cost about $500 per processor more than an equivalent off-the-shelf computer A they offer a significantly higher level of integration, reliability and manageability than most remote access and server farm products.

Gibbs is a writer and consultant based in Ventura, Calif. He can be reached via the Internet at mgibbs@gibbs.com or by phone at (800) 622-1108, Ext. 504.

3Com

Continued from page 1L

it belongs, said Scott Lindsay, 3Com's director of marketing.

The switches will be manageable via Remote Monitoring (RMON) technology, which is in line with 3Com's announcement last week of RMON support across its entire product line (*NW*, Nov. 6, page 27).

As many as six switches can be stacked together by a proprietary 100M bit/sec interface.

Each switch has two such interface ports to link it with switches above and below.

The interface is an alternative to more costly FDDI or Asynchronous Transfer Mode links, according to Lindsay.

"FDDI and ATM will cost about $4,000 per switch, which is a serious impact on your price per port if all you're doing is using it to stack switches together," he said. "The cascade interface lets you stack boxes for free."

An entire stack could then be served by a single ATM or FDDI uplink to the LAN backbone. The switch will have one empty slot for a high-speed interface module. FDDI will be available in May 1996, with ATM to follow in the third quarter of next year.

By the end of next year, 3Com will also deliver a token-ring workgroup switch with 24 ports.

"It would go in the same place where you now find a hub and would have to be priced pretty much the same as those shared hubs. Otherwise, why bother?" Lindsay said.

Available in March, the LinkSwitch 2000TR will cost $8,000.

✆3Com: (408) 764-5000.

Compaq

Continued from page 1L

Compaq plans to start off selling NetWorth gear as stand-alone devices and eventually sell adapter, hub and switch cards bundled with servers.

The plan coincides with Compaq's larger goal to integrate hubs, switches and routers into servers to reduce network costs as well as ease network and systems management, said Doug Pushard, vice president of Compaq's Internetworking Products Group.

Tam Dell'Oro, principal at Dell'Oro Group, a consulting company in Menlo Park, Calif., said Compaq's move to integrate networking components in the server will be a wake-up call for Digital Equipment Corp., Hewlett-Packard Co. and IBM. While those competitors already have significant network products divisions, none has done much to integrate networking components with servers.

A step ahead

"This acquisition gets Compaq ahead of all their competitors in the PC and server industry," Dell'Oro said. "They are doing what users need — to put all of the pieces together."

Bundling network components into a single device allows the small network user to minimize the amount of vendor complexity and management hassles associated with having many interconnect devices, analysts said.

In addition, the integration could reduce network equipment costs and limit the need for multiple vendors' service and support programs.

Besides offering technology obtained via the Thomas-Conrad and NetWorth deals, Compaq's Pushard said that the company will evaluate FDDI and Asynchronous Transfer Mode options.

He did not specify, however, whether those technologies would be gained through acquisitions or partnerships. Nor would company officials comment about the possibility of acquiring higher end hub technology.

Compaq is considering breaking into the remote access market by partnering with leading LAN software vendors, such as Microsoft Corp. and Novell, Inc. ■

Hot products

Continued from page 1L

the other hand, it does not do much more than create directories and copy files. It would be nice if the installer was able to modify the server's start-up batch file to automatically launch the Web server.

Up and running

Once HTTPD starts, it presents a basic information screen that displays the initialization steps and then lists the documents retrieved. GLACI-HTTPD, which offers no other controls, is unloaded using the NetWare UNLOAD command.

GLACI-HTTPD supports click location-sensitive images that use National Center for Supercomputing Applications-formatted map files. It keeps a log file in a format similar to the CERN and NCSA formats.

Some of GLACI-HTTPD's best features are support for Unix-style personal home pages, IP access control and permission, and directory listings. The personal home page feature lets a name preceded by a tilde be interpreted as an alias and mapped to a specified subdirectory. Thus, a tilde preceding the name "mgibbs" might be mapped to sys:users\mgibbs.

The big omission from the product is support for Web server back-end applications. GLACI promises this for a later version but has not released details.

Using the IP access control, network managers can determine which IP addresses are allowed access to the Web server. While this is a good feature, sites with any kind of dynamic IP address allocation will not be able to use it. Via the directory listing feature, GLACI-HTTPD returns a Web page listing a requested subdirectory in which there is no default page. The default page, or welcome page, as GLACI calls it, is named welcome.htm.

Plus and minus

The big omission from this product is support for Web server back-end applications. GLACI promises this for a later version but has not released details.

On the plus side, GLACI-HTTPD is a solid and well-priced Web server that is slowly but surely maturing. GLACI has missed delivery of a secure version of HTTPD that will support the Secure Sockets Layer protocol. However, GLACI needs to accelerate its development schedule if it wants to maintain ownership of the NetWare Web server market.

Other players have recently started rushing into the NetWare Web server market, including Electronic Dimensions, or Edime, of Canberra City, Australia. Although brand new, the product, called Webware, looks mature.

Net managers can download the Demo version from Edime's Web site — http://www.edime.com.au — and supposedly run the Webware server for 30 days. (For some reason, my copy set itself to a 15-day time-out.) The Demo software has a limited feature set. For example, Edime has disabled the support for running back-end server applications.

Installation of the Demo version is somewhat primitive: It requires that you manually copy the NLM and control files to SYS:SYSTEM.

But once you get Webware running, a number of features make it appealing.

The first is an extensive server console display that shows configuration, diagnostics and activity reports. When you press Escape, a menu appears. It offers options to read the configuration, change the diagnostics, see product information or shut down the server.

Unfortunately, the software does not offer an option for modifying Webware's configuration from the server console. Since it does not, the configuration file has to be manually edited.

The diagnostic capabilities are interesting. If you turn on the diagnostics, the detailed HTTP request data is output to the screen and optionally entered in the log. In addition, a loopback option can echo a request in a plain-text format back to the browser instead of returning the requested document. This could be a great tool for developing Web technologies and applications and for resolving

See **Hot products,** *page 10L*

Hot products

Continued from page 9L

obscure technical support problems.

Includes on the side

Webware supports a number of server-side includes, which are special commands in Web documents that result in an action being taken or data being put in the datastream in place of the command. Webware has four server-side includes:

- <<COUNT>> inserts an automatic page access counter.
- <<DATE>> inserts the date/time of the page access.
- <<EMBED=filename>> inserts the named file. This is a useful command for reusing boilerplate text and forms.
- <<TRIGGER>> toggles the DTR line of a serial port for a specific period. This offers interesting possibilities for controlling devices such as data acquisition systems.

Security

Webware provides two main levels of security. When LOGINSECURITY is set to On in the configuration file, the software requires a NetWare logon name and password. These are specified on the command line when loading Webware. The NetWare logon name and password restrict Webware according to normal NetWare directory access controls.

If LOGINSECURITY is off, Webware runs as an unrestricted NLM. This is simpler to administer but less secure.

The next level of access control is set through files named #ACCESS.CTL. If the Webware server finds such a file in the directory from which it is requested to retrieve a page, only the IP addresses listed in that file are granted access. An empty #ACCESS.CTL file blocks all access. Access at deeper levels in the directory tree can be enabled with further #ACCESS.CTL files.

Edime has an interesting take on back-end application support. Because applications that run in the NetWare server environment are difficult to develop, Edime has created its own language system for creating back-end applications.

Based on the documentation on the company's Web site and in the beta releases, this sophisticated technology will allow for extreme customization of the Web server.

Unfortunately, net managers will not be able to test back-end application support with the Demo or Lite versions of Webware.

The Lite version is essentially the Demo version without the drop-dead date. It is keyed to specified NetWare license numbers and supports serial-line triggers.

Multiple flavors

Edime offers the free Demo software in a version for NetWare 3.11 and one for Version 3.12 and higher. Both have a 30-day time-out.

Edime also is designing a product called Webware Commercial for more sophisticated organizations with many or large Web sites. Also keyed to specific NetWare licenses, it will support a Web search engine across the Web server directories, the ability to access data on multiple servers from a single server and global control features to manage multiple Web sites from the same server.

Also under development is the Enterprise version of Webware.

Edime will target this top-of-the-line product at Web providers and organizations that need information distribution and management for multiple servers. It will have an unlimited license, integrate with Novell Btrieve — data storage will be based on the Btrieve database engine — and include built-in statistical analysis tools along with Secure Sockets Layer support and authentication services.

Which Web works?

Of the two products discussed, Edime's Webware is more sophisticated. The company also has articulated more advanced development plans than GLACI. On the other hand, GLACI-HTTPD costs less (see graphic, page 1L) than Webware but does the same basic job of serving up Web pages.

Given the relative youth of this market, network managers should wait to see how it develops before making a major product commitment. But as a test bed, GLACI's low-cost product is a good bet. ■

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Security Dynamics scales server software for big sites

By Joanne Cummings

Cambridge, Mass.

Security Dynamics Technologies, Inc. has taken two steps toward its goal of making its products more robust and scalable for enterprise LANs.

First, the company has migrated the previously flat, file-based database server portion of its ACE/Server security software to a relational database management system from Progress Software Corp. Second, it announced the software will now interoperate with Trusted Information Systems' (TIS) Gauntlet Internet Firewall.

"Scalability has been a problem for Security Dynamics before this release," said Mike Rothman, vice president of global network strategies at META Group, Inc., a network consulting firm in Reston, Va. "Large sites with thousands of users were finding it difficult to get the ACE/Server to support those numbers efficiently."

This release solves that, company officials said. "We wanted to enable our customers to roll out security beyond the departmental level," said Eric Ogren, product manager at Security Dynamics, located here.

Who goes there?

Like its predecessors, the ACE/Server Version 2.0 software runs on Unix servers.

The software authenticates users accessing the network via Security Dynamics' SecurID token card. When users log on to a network configured with ACE/Server, they are prompted for a password. Users then enter a personal identification number followed by the access code displayed on their SecurID card. The server portion then authenticates the user and grants network access.

By migrating the ACE/Server's database to a relational DBMS, the software is able to authenticate users more quickly. This means it can support more users.

The product is also now equipped with a graphical user interface, which together with the relational DBMS structure, streamlines security administration.

"Users can build reports detailing things like who accessed the network, when and which applications they used, about twice as fast as in the previous version," Ogren said.

Users said the new version also lets multiple administrators simultaneously access the database. This feature is especially useful in large networks, they said.

"With the previous version, only one administrator at a time could access the software. And when we did massive changes, like adding 50 or 60 users and cards, we'd have to wait until that process was finished before anyone else could get on the system. Now multiple administrators can use it at once," said Bruce Rowland, operations manager of the data security group at Bell Canada in London, Ontario.

Version 2.0 also now comes bundled with Progress's fourth-generation programming language, its standard SQL interface and support for distributed applications. This enables users to integrate security into custom or proprietary network applications, as well as to use and administer ACE/Server from any location throughout the enterprise, Ogren said.

ACE/Server Version 2.0 started shipping early this month. A 10-user license costs $2,450, and free upgrades will be available to users with warranties or maintenance contracts.

Using SecurID authentication with TIS' Gauntlet Internet Firewall will enable LAN managers to positively identify users accessing private networks via the Internet, he said. "It helps to bolster the firewall's own security mechanisms."

The TIS firewall supporting the Security Dynamics technology is available, but pricing was unavailable at press time.

Security Dynamics: (617) 574-7820.

Cummings is a freelance writer in Marlborough, Mass.

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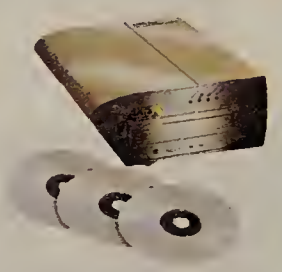

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Circle Reader Service #6

HP and Starlight unite on multimedia server front

By Ben Heskett
Las Vegas

Hewlett-Packard Co. has enlisted Starlight Networks, Inc. in an attempt to bring digital video technology to the LAN and beyond.

Initially, HP will pair its Intel Corp.-based NetServer hardware with the new edition of Starlight's NetWare-based video software, StarWare 2.0, which will be introduced at Comdex/Fall '95 here this week. By joining forces, HP and Starlight will address the multimedia networking needs of workgroups or sites comprising up to 100 end users on a low-cost hardware platform.

Next year, HP and Starlight will address the needs of enterprise network customers. The companies have agreed to port Starlight's StarWorks software to HP 9000 servers running HP-UX, providing a video networking platform for hundreds of end users.

The offerings will enable customers to establish and index multimedia libraries, among other things.

The new version of StarWare can deliver 1.5M bit/sec of MPEG-1 video to as many as 100 simultaneous end users over a variety of network types, including Ethernet, 100Base-T and Asynchronous Transfer Mode. Version 1.0 could handle up to about eight concurrent end users.

HP and Starlight will address the multimedia networking needs of workgroups or sites comprising up to 100 end users on a low-cost hardware platform.

The new software also includes new management tools to reserve bandwidth for important applications and more.

StarWare 2.0 will be available Dec. 15 for about $28,000, bundled with an HP NetServer. The software alone ranges in price from $4,995 for 10 end users to $34,995 for 100 end users.

HP and Starlight will provide a variety of preconfigured packages supporting video training and other applications.

©HP: (800) 322-4772; Starlight: (415) 967-2774.

Laube

Continued from page 2L

According to Laube, many customers have told Novell that its change in strategy is exactly what they have been trying to do. In one recent conversation, Laube said, a customer told him, 'We use NetWare, but we have decided that for a database, we'd like to use Oracle on Sun systems. We'd like a way of integrating them together so the world looks consistent to us. This is the answer to our prayers.'''

Laube has drawn on his wealth of experience as a user to guide Novell in implementing its new strategy. At Price Waterhouse, Laube helped clients learn how computing technology could solve many of their accounting and business problems. His job at Novell is similar, he said.

''Our main goal [at Novell] is to help people solve their problems connecting computers and leveraging their investments in information technology,'' Laube explained.

Indeed, it is Laube's experience as a customer that makes him so valuable to Novell, said Christine Hughes, senior vice president of corporate marketing at Novell.

''As a member of the senior management team, Sheldon has been an excellent catalyst for putting a customer perspective into our thinking,'' Hughes said. ''Any company can articulate a new strategy, but unless on top of that you ask yourself what value you are bringing to the customer, you are missing an important element.''

Bushaus is a freelance writer in Chicago.

"I never know what the company's going to ask of our

NETWORK, *so I just tell 'em, 'Hey, we're* FLEXIBLE.' HP *AdvanceStack* 10BASE-T *hubs keep me honest."*

I was one of those kids who had an HP calculator at the ready constantly, and I knew the words Hewlett-Packard stood for quality and reliability. But when it comes to the world of networking, that's only part of the HP story, as I soon discovered.

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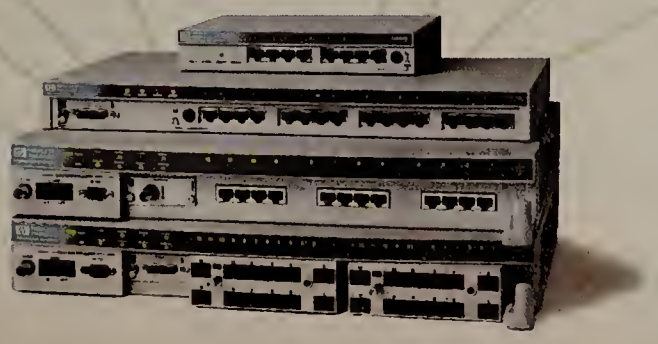

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NET RESULTS

Does Compaq know networking?

Skip MacAskill and Melinda Le Baron

Acquisitions in the networking industry are a dime a dozen these days, but Compaq Computer Corp.'s plans to buy NetWorth, Inc. and Thomas-Conrad Corp. manage to stand apart.

These are among the few significant deals we can think of in which a computer company is attempting to buy its way into the network equipment market.

In the case of NetWorth, Compaq last week said it plans to fork over a cool $372 million, between six and seven times the hub maker's projected revenue this year. That beats Cisco Systems, Inc.'s recent agreement to pay 10 times projected revenue for Grand Junction, Inc.

But we still have to ask ourselves the question, can a computer vendor understand networking technology and the networking market?

It is clear from IBM, Digital Equipment Corp. and Hewlett-Packard Co. that computer vendors can build networking equipment and develop a successful networking business.

But can a large, successful PC vendor actually enjoy harmony and a consistent product strategy with a smaller networking vendor such as NetWorth? Can a vendor that has been focused on providing mainly desktop systems view networks as more than plumbing?

Only time will tell. But in the meantime, here are some things worth noting about Compaq and NetWorth:

■ With the efficient manufacturing capabilities of Compaq and Thomas-Conrad, the cost of producing NetWorth's already-competitively priced equipment could fall even further. Combine that with Compaq's high-volume sales channels, and other low-end network equipment vendors could be forced to cut their prices even lower.

■ Compaq has made mention of integrating network technology from NetWorth and others within its servers. If this is the case, a hub in a server, a switch in a server and possibly a router in a server could all be in Compaq's future. These offerings could address the needs of workgroups and branch offices but would be of little use at the heart of enterprise networks. We cannot imagine a large company using a server, for example, as both a fast Ethernet switch and a key application platform.

■ UB Networks, Inc., which holds a 10% equity stake in NetWorth, stands to turn a $5 million investment in the hub company into a $45 million gain via the Compaq deal. NetWorth's OEM relationship with UB will continue, based on a three-year letter of intent signed in late July. Under the agreement, UB counts on NetWorth for GeoRim switch technology as well as low-end hub offerings. We do not expect the relationship to change, at least in the short term.

(As an aside, UB's parent company, Tandem Computers, Inc., recently announced plans to integrate its high-speed ServerNet technology with Compaq servers.)

With Thomas-Conrad and NetWorth almost in the bag, what's next for Compaq? The company seems to believe it has assembled the key pieces to form an enterprise networking strategy. But not so fast. To become an end-to-end network provider, Compaq needs to obtain technology that works well in the network backbone and enables the company to address remote LAN access needs. It also needs to contend with Asynchronous Transfer Mode as more than just another server card.

MacAskill is a senior research analyst and Le Baron is a research director in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached by E-mail at inquiry@gartner.com or by phone at (203) 316-1111.

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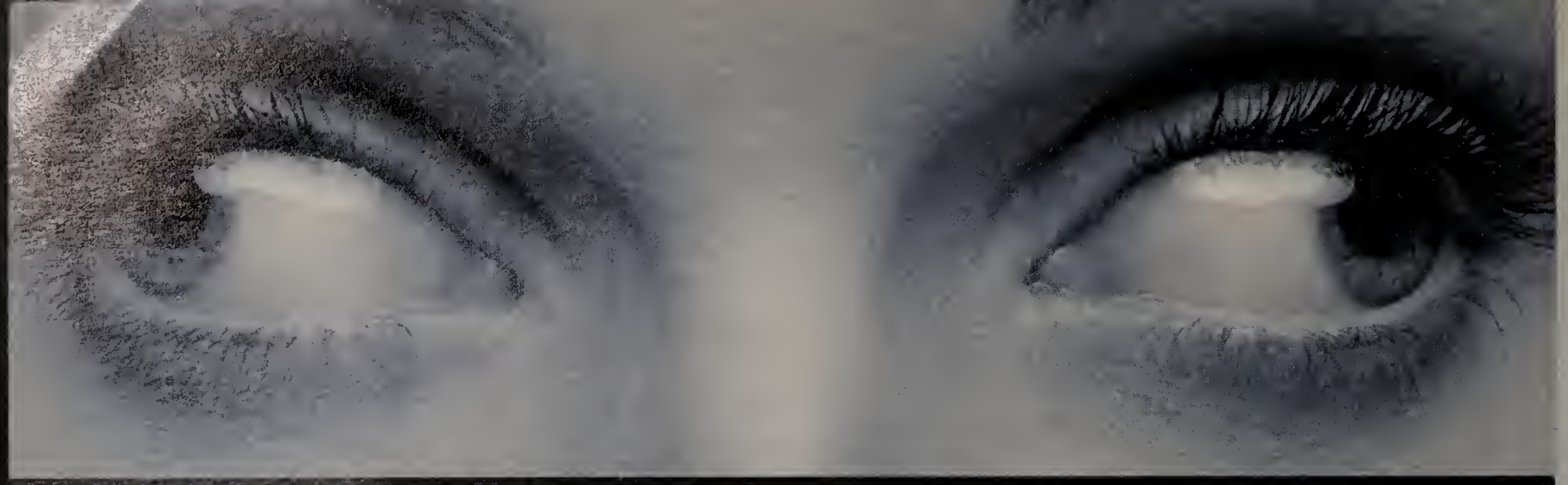

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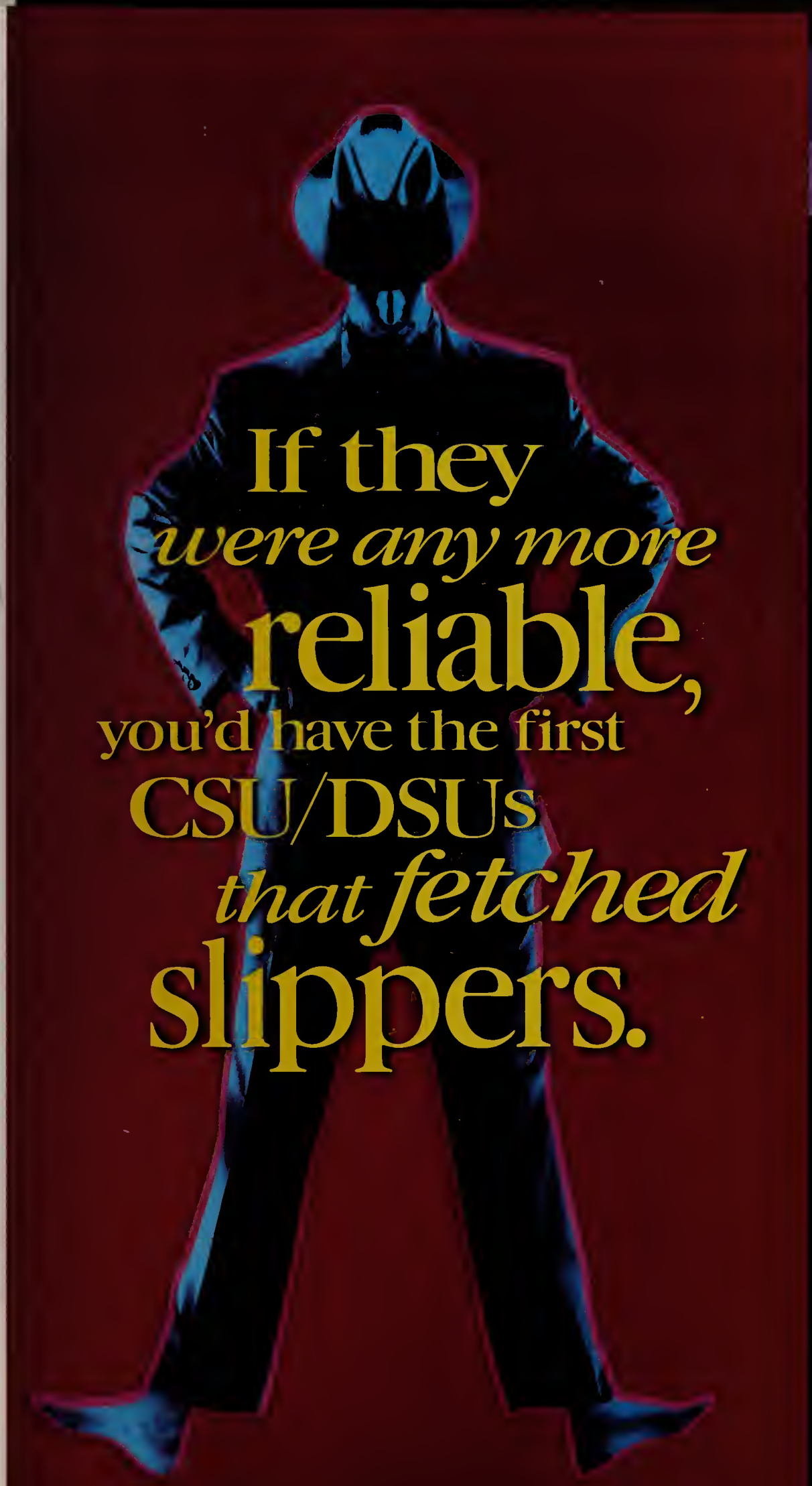

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- Standalone or carrier card versions
- Support for standard IBM multiport SNA applications

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- Standalone or carrier card versions
- Flexible point-to-point and multipoint operations
- Fault isolation through standard Loopback diagnostic tests

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Briefs

■ **Lotus Development Corp.** *has announced the first in a series of imaging applications designed to serve as a bridge between the VisualInfo server portion of IBM's* **ImagePlus** *product family and Lotus Notes. The initial offering is a gateway that runs on Windows NT and lets end users exchange image documents, folders and notes.*

The Lotus Notes-to-IBM ImagePlus Connection will cost about $4,995. The product is expected to be available by the end of the year.

Lotus: (800) 346-1305.

■ **Gupta Corp.** *of Menlo Park, Calif., last week announced SQLHost for Visual Basic,* **middleware** *for linking Visual Basic applications to mainframe data sources via TCP/IP.*

The software can access IBM DB2 and nonrelational data sources such as IMS, VSAM, IDMS and Adabas. Available now, SQLHost for Visual Basic costs $34,995.

Gupta: (415) 321-9500.

■ **TeamWARE,** *a division of ICL, Inc., and* **Fujitsu Open Systems Solutions, Inc.** *are shipping TeamWARE Imaging 3.5, a set of integrated client tools for* **document management.**

Using the software, images can be stored, retrieved and manipulated locally on a user's desktop. TeamWARE Imaging may run as a stand-alone application or in conjunction with TeamOffice, the company's messaging, conferencing and group scheduling system. TeamWARE Imaging costs $195 per user.

TeamWARE: (408) 982-3026.

■ **Arbor Software Corp.** *in Sunnyvale, Calif., and* **Clarify, Inc.** *of San Jose, Calif., both went public last week.*

Arbor's initial public offering for 1.8 million shares of stock was $17 per share. The company sells a multidimensional database that culls information from legacy systems for use in decision-support applications.

Clarify, which markets client/server customer service applications, issued about two million shares at $13 per share.

Firm making progress with apps development tool

By John Cox
Bedford, Mass.

The newest version of Progress Software Corp.'s widely used application development tool set includes a way to build reusable software components that can be linked —- eventually over a network — to create an application.

Progress 8.0 ships this week with its powerful fourth-generation language now sandwiched between an object-oriented front end and an internal communications framework that lets objects work together. But the full potential likely will not be seen until sometime next year, when Progress releases additional software to let objects work together over a network.

The company also has included Starbase Corp.'s Roundtable Total Software Management System (TSMS) in a special enterprise version of Progress. TSMS is a set of tools for managing large, complex software projects. Progress has also scrapped its old pricing scheme for a simpler one based on concurrent user licensing.

"One of our main goals was to package advanced technologies, such as object-orientation, so that these were practical, useful and easy to use," said Charles Ziering, chief technology officer at Progress.

In the past, the Progress family consisted of the Progress fourth-generation language, a Progress relational database management system, the User Interface Builder, various reporting tools and some team development facilities.

Progress 8.0 adds what Ziering calls the Application Component Environment (ACE), which is an approach to building objects. A developer can drag objects or components into an editing window in the User Interface Builder. Then the ACE automatically generates the message links among the components and builds the needed transaction processing and data management code to finish the application.

Intelligent objects

The new tool set also comes with a set of ready-to-use graphical user interface components — written in the Progress fourth-generation language — called SmartObjects, which developers can drag into the User Interface Builder to quickly set up an application.

These objects are stitched together on the desktop by a messaging framework, called SmartLinks, which is coordinated by the Link Broker process. This process runs on each client machine and works with a database that lists each object, the methods or functions it can do and the different messages it can receive or send.

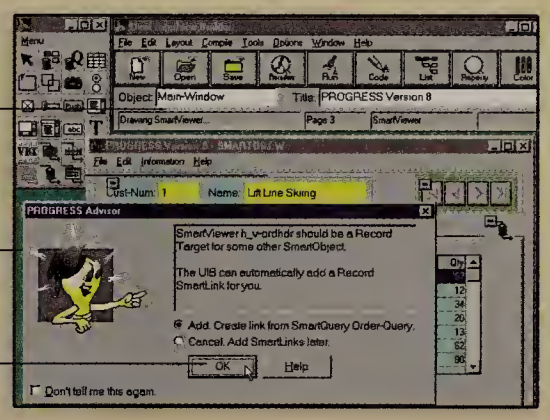
This SmartLinks framework, along with Link Broker, is what Progress will distribute on networked servers by April 1996. The framework, officials said, can eventually make use of the communications defined in object models such as OLE/Component Object Model from Microsoft Corp.

"It was very easy putting these components together; you just point and click, and drag them onto the screen," said Kim Irvine, systems analyst with Medical Practice Management Inc. (MPM), a Richmond, Va., com-

See **Development tool,** *page 54*

OBJECTS GET SMART IN NEW PROGRESS RELEASE

The Progress 8.0 toolset includes a way to build intelligent objects and assemble them into client/server applications. The vendor will support network connections among objects by June 1996.



User-turned-vendor says X.400 is needed now more than ever

Q&A

Roger Mizumori, who for years had been part of The Boeing Co. team building an X.400 electronic messaging backbone, has made the jump from user to vendor.

Once a spokesman for electronic mail users through a variety of industry groups and standards bodies, Mizumori hopes to keep user's interests in mind as director of the newly formed messaging architecture planning services group at Westlake, Calif.-based Enterprise Solutions, Ltd., an X.400 messaging software vendor.

Mizumori spoke with *Network World* Senior Editor John Cox about the increasing relevance of X.400, some of the lessons he learned at Boeing and what MIS groups can expect in 1996.

Is X.400 for enterprise E-mail nets ever going to catch fire?

More companies are investigating what X.400 can do for them. They are realizing that to achieve business goals like quicker response times and reduced product development time, they are dependent on immediate information access. And they need to have this done in a reliable form and in such a way that they can trust the quality of the information.

Mizumori *says "most companies are investigating what X.400 can do for them."*

Why can't companies get what they need from a proprietary LAN electronic mail package?

X.400 puts all that rich functionality right in the backbone. For example, there are a number of E-mail products that let you send multiple attachments [with a message]. But if your [mail] backbone only supports one attachment, you can only send one; it doesn't matter what you can do locally. The X.400 standard supports multimedia, full attachments, security and reliability.

When you look at the emerging client/server products for LAN messaging, like Microsoft Exchange, you see a recognition by these vendors that X.400 provides these services. So there's heavy integration in those products with X.400.

So we're close to heaven?

That transition [from LAN, file-based to enterprise client/server mail systems] will not be simple. Look at Microsoft and Lotus: They've been going through a lot of churning to integrate their legacy products with the new architectures.

Can't the Internet make that easier?

The Internet is a variety of services, one of which is messaging. I'm not going to get into a debate about X.400 vs. the Internet; X.400 runs on the Internet, over TCP/IP. So there's a lot of ways in which they can coexist. But if you look at Simple Mail Transport Protocol vs. X.400, that's very different.

How?

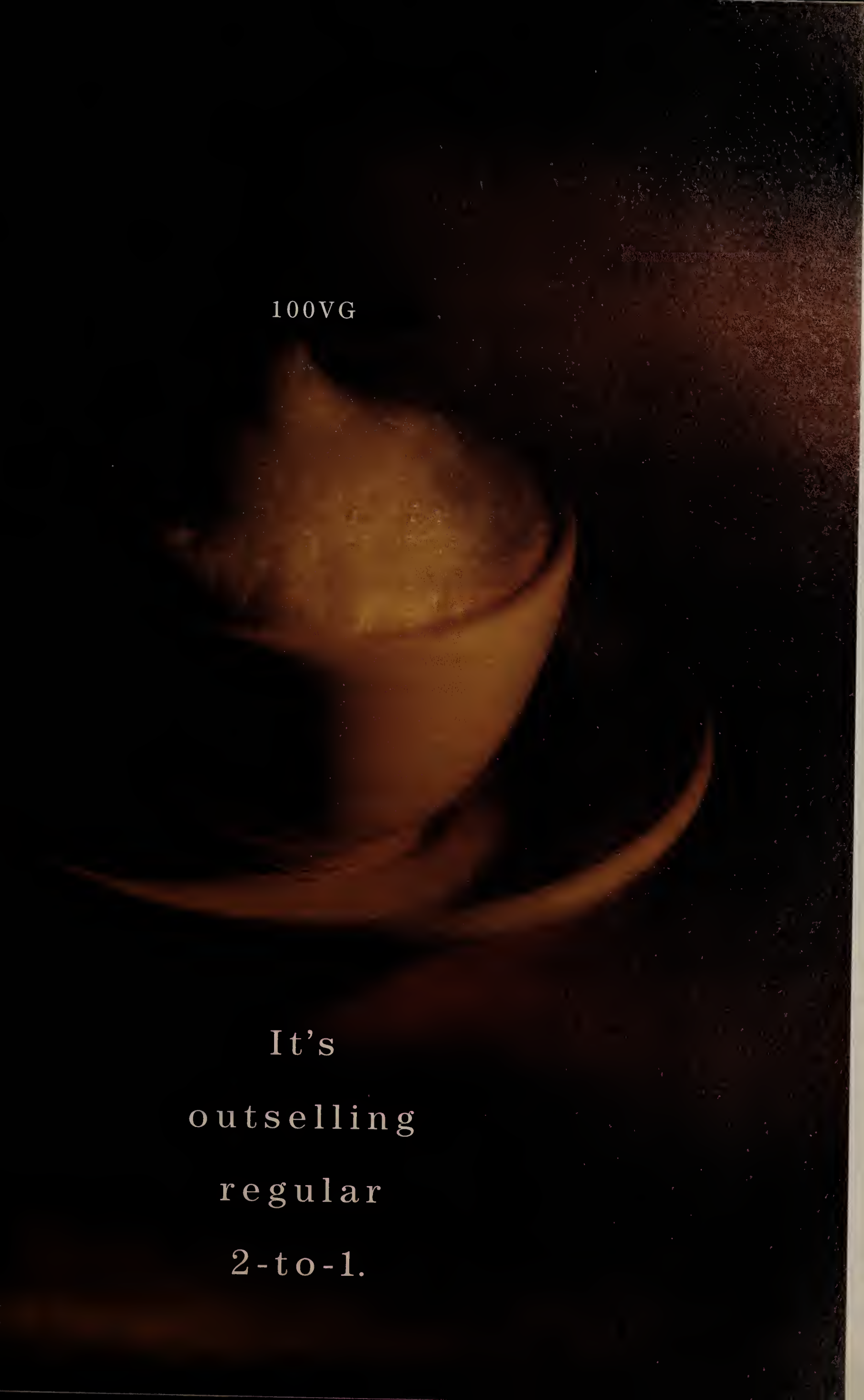
X.400 is a mature technology.

See **X.400,** *page 52*

NetworkWorld Fusion

For a primer on X.400, including information on how to put an X.400 address on your business card, see Network World Fusion. Select News+ then Client/Server Applications.

100Base-T



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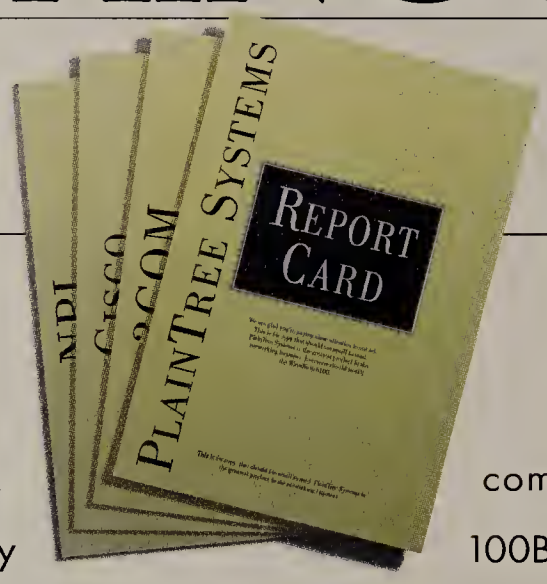

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09. ☐ Utilities
10. ☐ Education
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13. ☐ Military
14. ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/Communications)
18. ☐ Resellers of Computer/Network Products (VARs, VADs, Distributors)
19. ☐ Systems/Network Integrators
20. ☐ Distributors (Computer/Communications)
21. ☐ Other *(please specify)*_____

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management (CIO, CEO, Pres., VP, Dir., Mgr., Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other *(please specify)*_____

3 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. INVOLVEMENT (check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

5 Check ALL that apply in Columns A and B:

A. I am involved in the purchase of the following products/services:
B. I plan to purchase the following products/services:

A	B	
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☐	☐	13. SNMP Network Management
☐	☐	14. ATM Switches
☐	☐	15. Token-Ring Switches
☐	☐	16. Ethernet Switches
☐	☐	17. Remote LAN Access/Communications Servers
☐	☐	18. Superservers
☐	☐	19. File/Application Servers
☐	☐	20. Print Servers
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☐	☐	22. Routers
☐	☐	23. Bridge/Router
☐	☐	24. Gateways
☐	☐	25. Intelligent Hubs/Stackables
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☐	☐	33. Cluster Controllers
☐	☐	34. Monitors
☐	☐	35. Fax/Modem Boards
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☐	☐	40. Wireless LANs
☐	☐	41. Cellular Equipment & Services
❑	❑	**104 INTERNET/ELECTRONIC COMMERCE**
☐	☐	42. Internet Access Providers
☐	☐	43. Firewalls
☐	☐	44. Web Servers/Browsers
☐	☐	45. Internet Software Tools
❑	❑	**105 SOFTWARE/APPLICATIONS**
☐	☐	46. Network Management
☐	☐	47. Systems Management
☐	☐	48. Security
☐	☐	49. Communications Software
☐	☐	50. Terminal Emulation
☐	☐	51. Word Processing
☐	☐	52. Operating Systems
☐	☐	53. Client/Server Applications Development
☐	☐	54. Database Management/RDBMS
☐	☐	55. Spreadsheet
☐	☐	56. Groupware
☐	☐	57. EDI
☐	☐	58. E-mail
☐	☐	59. Windows/Graphical User Interface
☐	☐	60. Multimedia
☐	☐	61. Graphics/DTP
☐	☐	62. Remote Access
☐	☐	63. Imaging
☐	☐	64. Suites
☐	☐	65. Middleware
☐	☐	66. Document Management
☐	☐	67. Database Server
☐	☐	68. Site Metering Tools
☐	☐	69. Computer-Integrated Telephony (CIT)
❑	❑	**106 WIDE-AREA NETWORK EQUIPMENT & SERVICES**
☐	☐	70. Frame Relay Equip./Services
☐	☐	71. Modems
☐	☐	72. FT-1/T-1/T-3 Multiplexers
☐	☐	73. FT-1/T-1/T-3 Services
☐	☐	74. SONET
☐	☐	75. Inverse Multiplexers
☐	☐	76. SMDS
☐	☐	77. Asynchronous Transfer Mode
☐	☐	78. Diagnostic/Test Equipment
☐	☐	79. DSU/CSU
☐	☐	80. VSAT/Satellite
☐	☐	81. ISDN Equipment & Services
☐	☐	82. PBXs
☐	☐	83. Voice Mail/Response
☐	☐	84. Videoconferencing
☐	☐	85. Leased Lines
☐	☐	86. Switched Data
☐	☐	87. E-mail/On-line Services
☐	☐	88. 800/900/MTS Services
☐	☐	89. Virtual Networks
☐	☐	90. Outsourcing/Systems Integration Services
☐	☐	91. Education/Training Services
☐	☐	92. None of the above (1-91)

6 What is the total number of LANs, workstations/nodes at this location/ in your organization?

At this location: LANs		Workstations/ Nodes	Entire organization: LANs		Workstations/ Nodes
1.	☐ 5,000+	☐	1.	☐ 5,000+	☐
2.	☐ 1,000 - 4,999	☐	2.	☐ 1,000 - 4,999	☐
3.	☐ 100 - 999	☐	3.	☐ 100 - 999	☐
4.	☐ 50 - 99	☐	4.	☐ 50 - 99	☐
5.	☐ 10 - 49	☐	5.	☐ 10 - 49	☐
6.	☐ 1 - 9	☐	6.	☐ 1 - 9	☐

7 Check ALL that apply in Columns A and B:

A. The following network platforms are currently installed:
B. The following network platforms are planned for purchase:

A	B	
❑	❑	**55 NETWORK ARCHITECTURES**
☐	☐	01. SNA
☐	☐	02. DECnet
☐	☐	03. TCP/IP
☐	☐	04. Novell IPX/SPX
☐	☐	05. APPC/APPN/LU 6.2
☐	☐	06. NETBIOS
☐	☐	07. AppleTalk
☐	☐	08. NFS
☐	☐	09. Other *(please specify)*_____
❑	❑	**56 NETWORK OPERATING SYSTEM**
☐	☐	10. Microsoft (LAN Manager)
☐	☐	11. Novell (NetWare 2.X, 3.X)
☐	☐	12. Novell (NetWare 4.X)
☐	☐	13. Windows NT
☐	☐	14. Windows NT/Advanced Server
☐	☐	15. LocalTalk (AppleTalk)
☐	☐	16. Banyan (VINES)
☐	☐	17. IBM (LAN Server)
☐	☐	18. IBM (PC LAN Program)
☐	☐	19. Artisoft (LANtastic)
☐	☐	20. Digital (Pathworks)
☐	☐	21. Other *(please specify)*_____
❑	❑	**57 LAN ENVIRONMENT**
☐	☐	22. 4M Token Ring
☐	☐	23. 16M Token Ring
☐	☐	24. Ethernet
☐	☐	25. 100M Ethernet
☐	☐	26. StarLAN
☐	☐	27. FDDI
☐	☐	28. LocalTalk
☐	☐	29. 10Base-T
☐	☐	30. ATM
☐	☐	31. Other *(please specify)*_____
❑	❑	**58 COMPUTER OPERATING SYSTEM**
☐	☐	32. DOS
☐	☐	33. Unix/Xenix/AIX
☐	☐	34. OS/2
☐	☐	35. OS/2 Warp
☐	☐	36. IBM MVS
☐	☐	37. IBM VM
☐	☐	38. Digital VMS
☐	☐	39. Macintosh
☐	☐	40. Windows
☐	☐	41. Windows 95
☐	☐	42. X Window System
☐	☐	43. Solaris
☐	☐	44. Other *(please specify)*_____
☐	☐	45. None of the above (1-44)

8 For which areas outside of North America do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Do you have or plan to install client/server networks? ☐ Yes ☐ No

10 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

Mainframes	A – Installed	B – Planned
1. IBM	☐	☐
2. Amdahl	☐	☐
3. Cray	☐	☐
4. Hitachi	☐	☐
5. Unisys	☐	☐

Minis	C – Installed	D – Planned
1. IBM	☐	☐
2. Digital	☐	☐
3. Tandem	☐	☐
4. Unisys	☐	☐
5. AT&T GIS	☐	☐
6. HP	☐	☐
7. Data General	☐	☐

Which of the following do you have installed/planned: (USE NUMBERS ONLY)

	At this location: E – Servers	At this location: F – Clients/Nodes	Entire organization: G – Servers	Entire organization: H – Clients/Nodes
1. Power PC				
2. Power Macintosh				
3. Macintosh (Other)				
4. Pentium-based				
5. 80486-based				
6. 80386-based				
7. 80286-based				
8. RISC-based workstations				
9. Other				

11 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

01. ☐ $100 million or more
02. ☐ $50 million - $99.9 million
03. ☐ $25 million - $49.9 million
04. ☐ $20 million - $24.9 million
05. ☐ $10 million - $19.9 million
06. ☐ $5 million - $9.9 million
07. ☐ $1 million - $4.9 million
08. ☐ $500,000 - $999,999
09. ☐ $250,000 - $499,999
10. ☐ $249,999 or less
11. ☐ None of the above

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ $10 billion or more
2. ☐ $1 billion to $9.9 billion
3. ☐ $500 million to $999.9 million
4. ☐ $100 million to $499.9 million
5. ☐ $50 million to $99.9 million
6. ☐ $10 million to $49.9 million
7. ☐ $5 million to $9.9 million
8. ☐ $4.9 million or less
9. ☐ None of the above

13 Estimated number of employees at this location/in entire organization:

At this location:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

Entire organization:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

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SHARED LOGIC

What the crystal ball reveals

When John Gallant, *Network World's* ever-humble editor-in-chief, invited me to participate in the "Networking Hot Topics" panel at Comdex/Fall '95 this Wednesday morning, I jumped at the opportunity.

What could be better than prognosticating on the future and doing a post-mortem of the past. I'll even get to butt heads with some of my analyst cohorts.

So, without further ado, here are my fearless predictions for 1996:

■ **Delivery of client/server messaging servers.** Finally, after three years, we will finally see next-generation messaging servers from the likes of Lotus Development Corp., Microsoft Corp. and Novell, Inc. They will not be everything to everyone right off the bat, but they will be a heck of a lot better than your current shared file infrastructure. I'd get them in the lab ASAP, but don't think about starting the full-scale migration until summer.

■ **Deflation of the groupware myth.** There is a fairly dangerous myth out there that if you plug in a collaborative software environment, all of your business process problems just go away. Well, in 1996, we will discover that just isn't the case. Companies with successful groupware implementations have spent thousands of hours evolving their business processes to facilitate collaborative automation and building the requisite application to take advantage of the new business process. One won't work without the other.

Mike Rothman

■ **Internet hype backlash.** The Internet cannot possibly live up to everyone's wacky expectations. I still don't think I'll be connecting to the 'Net to get my coffee brewed in the morning. We'll find the Internet is still a potent marketing channel and some brave souls will even start buying stuff from Internet shopping malls. But it still won't become an engine for business-to-business transactions or application transport in 1996. However, we will see an acceleration in the use of internal Internet servers for information dissemination.

■ **API wars: not again.** Yep, again. Next year's battle will be Microsoft's ODSI vs. Novell's Net2000, with the future of Novell at stake. If Novell can't get application developers to care about Net2000, you'll hear the two minute warning bell toll and something about a fat lady. Most developers will support both, not wanting to give up on either massive installed base.

And that brings up my "wildcard" for 1996:

■ **Novell gets bought . . . by Oracle Corp.** Without the WordPerfect application albatross around its neck, Novell will look a lot better as an acquisition target. IBM is the most logical choice to buy Novell, but its stomach acid is still working overtime digesting Lotus. HP is a dark horse, but the company has never really shown a penchant for buying technology.

Yet Oracle makes some sense. Give Oracle a directory and a real groupware/workgroup product, and it could be an even more dangerous competitor than it already is. That's without even considering the obvious channel synergies. Maybe Larry Ellison will give Bill Gates a run for his money. If I'm right on this one, you all owe me a beer.

The one sure bet for 1996 is that it will be an exciting year. But do me a favor: Take the Rothman Challenge by saving this column and keeping me honest. We all need that every so often.

Rothman is a vice president in META Group's Global Networking Strategies service in Reston, Va. Feedback is welcome either by E-mail at MikeR@metagroup.com or by phone at (703) 860-6600. Rothman's column alternates in this space with that of Marc Myers, president of Client/Server Connection, Ltd.

Database makers mix it up with middleware

By Barb Cole

Two companies are readying middleware for integrating their niche databases with mainstream relational systems.

Object Design, Inc. this week will announce ObjectStore DBconnect, software that lets developers access relational data for use in object-oriented applications built with C++ and the company's ObjectStore database.

Without such middleware, developers wishing to marry relational data with object application tools face two choices. They may either write specialized applications to translate relational data into an object-like format, or they may buy prebuilt software known as object wrappers.

If done manually, mapping objects to relational data can chew up about 30% of application development time, according to Patrick O'Brien, director of marketing at Object Design, based in Burlington, Mass.

The object wrappers, though more efficient than hand coding, are limited in that data must still be stored in a relational database.

Object Design will look to further link its object database to relational systems, possibly giving users the ability to update both ObjectStore and relational data using one transaction manager. It will also investigate letting customers manage ObjectStore replication using tools from mainstream database providers such as Oracle Corp. and Sybase, Inc.

MIDDLEWARE MIX VMARK

Product	Price	Availability
HyperStar 3.0	From $2,500 for Unix to $25,000 for MVS	Now
ObjectStore DBconnect	$30,000	December

Credit Suisse in Zurich has been using a beta version of DBconnect since April to move data between DB2 on MVS and ObjectStore as part of a risk exposure application. Previously, the bank deployed the application using an object-oriented front end and a relational back end, but performance lagged.

DBconnect enabled the bank to achieve its performance goals because the relational data is moved to the object database and offers "tight and transparent integration with ObjectStore," said David Kamber, global limits system architect and lead developer at Credit Suisse.

DBconnect can access DB2, Oracle7 and Sybase SQL Server databases directly, as well as several others via IBM's DataJoiner middleware. The software runs on SunSoft, Inc. SunOS and Solaris. Support for Hewlett-Packard Co. HP-UX and Microsoft Corp. Windows NT will be added in 1996.

On the VMARK

Separately, Westborough, Mass.-based VMARK Software, Inc. announced HyperStar 3.0, middleware for accessing several relational and nonrelational data sources.

The new version supports Micro Focus, Inc. COBOL files and DB2 on MVS, and has an improved Open Database Connectivity interface that results in better performance, said Peter Fiore, vice president of corporate marketing at VMARK.

Although HyperStar does not require either the company's UniVerse relational database or its Object Studio application tool, analysts said the middleware would most likely be embraced by existing VMARK customers.

While the software's COBOL support is not unique, it's extremely important since much legacy data remains in COBOL files, said Brian Murphy, an analyst at The Yankee Group, a market research firm in Boston.

"When you talk to customers building applications, they inevitably want to talk about [how to get access to existing] COBOL," he said.

HyperStar runs on Unix and MVS.

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SunSoft adds spark to application development kit

By John Cox
Menlo Park, Calif.

SunSoft, Inc. last week released a version of its WorkShop tool set designed to exploit the company's Solaris 2.5 operating system and Sun Microsystems Computer Corp.'s (SMCC) new 64-bit UltraSPARC processor.

Solaris 2.5, formally unveiled last week, features a wide range of performance improvements for graphics, imaging, multiuser time-sharing applications and multithreaded applications. UltraSPARC is an advanced Reduced Instruction Set Computing processor that will support 64-bit applications and very large data sets.

WorkShop is SunSoft's development environment for building networked applications that can make the most of the underlying operating system and processor architecture.

Release 2.0 includes a feature that dissects code written in C and distributes it to run on two or more processors. New compilers make application development and deployment faster than before. And a library of high-performance computing algorithms has been extended for UltraSPARC, so applications simply issue a function call to access this computational power.

Also in the works is a WorkShop version for SMCC's Java language, which is used to create World-Wide Web server pages in the HyperText Mark-up Language. Early copies of WorkShop for Java are being sent to selected customers this month, with the general release planned for mid-1996.

An ultraperformer

WorkShop 2.0 delivers up to 15% better performance for applications on scalable processor architecture (SPARC) processors and 30% to 50% better performance on UltraSPARC machines, according to Joe Keller, director of marketing for developer products at SunSoft.

Two key tools in WorkShop — SPARCworks/Impact and SPARCompiler C — have been changed so they now can automatically turn C programs into parallel programs that are able to run on high-performance multiprocessing servers.

Previously, the SunSoft products did this only with FORTRAN code.

The WorkShop tool set is available for different languages: Visual WorkShop for C++ costs $2,995; WorkShop for C is priced at $2,195; and Performance WorkShop for FORTRAN costs $4,495. There are also versions for Ada and FORTRAN 77. All are available now.

©SunSoft: (800) 786-7638.

DecisionSuite to help users ferret out key relational data

By Barb Cole
Minneapolis

Information Advantage, Inc. last week announced DecisionSuite 3.0, decision-support software that includes four new applications for mining information out of relational databases.

The client-based applications are designed to enable a broad spectrum of users — from novice to expert — to easily tap into information contained in a data warehouse. They work with the software's server-based component, which can run on the warehouse server or on a separate one.

"Prior to this release, most of our customers wrote their own front-end [applications]. All we gave them in Version 2 [for graphical presentation] was a report writer," said Larry Ford, president and chief executive officer of Information Advantage.

DecisionSuite culls information from relational databases and performs sophisticated analysis on it before returning results to the client. Unlike most query tools, which do the bulk of their process-

See **DecisionSuite,** *page 52*

network let functions?

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DecisionSuite

Continued from page 49

ing on client computers, DecisionSuite does most calculations on the server, reducing the amount of data sent over the network. Also, DecisionSuite includes agents that can send updates or alerts to end users when information in the warehouse is revamped.

The new applications include InfoAlert, NewsLine, Analysis and Workbench.

InfoAlert is a basic interface for receiving alerts and reports, while NewsLine includes the capability to modify those reports and add or change filters.

Analysis and Workbench are aimed at power users and developers, respectively. The former lets users perform ad hoc analysis and create triggers and alerts, while Workbench may be used by database administrators to manage resources.

According to customers, the applications make it easier for end users to locate the information they need.

"Users can create their own reports and set filters without going to the IS department for help," said Perry Youngs, marketing information manager at Sara Lee Corp. in Cordova, Tenn. Sara Lee is using DecisionSuite to give more than 100 users access to market data on product sales. The use of agents and prewritten report templates help to minimize the network traffic associated with ad hoc queries, he said.

DecisionSuite is available now on Unix servers and Windows clients. The client applications are priced per user: $45 for InfoAlert, $145 for NewsLine, $895 for Analysis and $2,995 for Workbench. The server software costs $29,995.

©Information Advantage: (612) 820-0702.

X.400

Continued from page 41

SMTP was designed for a particular set of objectives. And it does those things well. But to make it more broadly applicable, [SMTP advocates] are developing a wide array of content structures to support things like multimedia and security... X.400 gives you all this.

But some things must be missing from X.400?

It's not so much that the specification is incomplete. In many ways, it's still an umbrella. There are some implementation agreements that still have to be established at the detail levels so vendors know how to build products.

For example, in X.400, there is the capability to send a binary file as an attachment and put a label on the attachment so you know what it is. That's all specced out in the standard.

But what format is the label, what are the attributes and so on? These details are being tackled by the Electronic Messaging Association's Message Attachment Working Group.

What's ahead for the EMA in the next six to 12 months?

The EMA's annual conference in April 1996 will have [a demonstration to show] interoperability between value-added networks and X.400 products, to support electronic data interchange.

Another area of work is an upcoming demonstration of some messaging management features — features like dynamic monitoring, which lets you monitor in real time the traffic between Message Transfer Agents. Another feature is message tracing, which lets you follow the path of a message and see where it actually ended.

What lessons from your Boeing years will you share now with your customers?

I was able to see at Boeing a lot of the challenges of scaling an E-mail network. And a lot of what people are facing today are scaling issues. They're looking at all these localized [E-mail] systems and trying to get these connected together across an enterprise and between enterprises.

How can you support communications between different companies?

Flexibility is real important here. And the best way to stay flexible is to establish an architecture and define its interfaces. As new technologies come out and new business partners appear, then you can plug and play. ■

"Do I have to drag a wire all over my warehouse just to keep my notebook in the network?"

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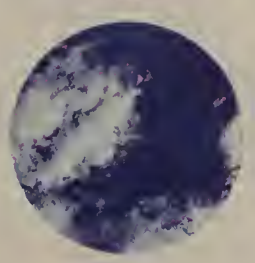

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IBM to bring VisualAge into the Web era

Tool will be enhanced for building Web-based client/server applications.

By John Cox
Boston

IBM is adding World-Wide Web support to its VisualAge application development tool set as part of an ambitious plan to marry the graphical forms found on Web servers with back-end corporate data and applications.

The enhancements will let developers build applications with front ends based on HyperText Mark-up Language (HTML) rather than OS/2 Presentation Manager or Windows, said David Fallside, the IBM programmer heading up the project.

Those front ends will then be able to tap into databases or other applications encapsulated in VisualAge wrappers at the server, creating a Web-based client/server application.

A future release of VisualAge, first for Smalltalk and then for C++, will introduce a folder of HTML Web parts. Developers will click on the folder, drag and drop HTML parts onto their editing screen, and create a graphical user interface that runs on a Web server and is accessed when a user connects with the server through a Web browser. IBM expects to begin beta-testing the VisualAge Web extensions around year-end, with a release planned for later in 1996.

IBM's approach in VisualAge, which is a set of visual tools and team programming features layered on top of different procedural languages, is different from that of Java, a Web development tool from Sun Microsystems Computer Corp.

FALL Internet World 95

"Java is aimed at the client side, not the server side of the application," Fallside said.

Security will be supported in two ways. One is via the secure Web protocol used by a browser like Netscape, which, in effect, makes the transmission between client and server safe.

Secondly, IBM will support the Secure HyperText Transfer Protocol protocol, which will let developers add to the VisualAge palette a set of secure objects that can be used in applications.

In related news, IBM's link between DB2 and the Web is almost ready. The software is now in the late beta-test phase. It will let users click on buttons within a Web form to access DB2 data on a back-end server. ■

Development tool

Cotninued from page 41

pany that provides billing services for doctors. MPM is using Progress 8.0 to create an appointment scheduling application. After some initial research, Irvine said, it was "fairly easy" to modify Progress components, for example, by removing the DELETE function from the list of methods to prevent an end user from deleting a patient record.

Irvine expects to employ Progress 8.0 to create a hierarchy of development. "We can use our experienced programmers to build the objects and the less experienced ones to assemble them in an application," he said.

"We can use our experienced programmers to build the objects and the less experienced ones to assemble them in an application."

The basic Progress tool set costs $3,600 per developer; the tool set bundled with the Starbase software costs $4,400.

Initially, the tool set will run on various Unix operating systems and Windows 3.1. It runs on Windows 95 as a 16-bit application. A 32-bit version for Windows 95 and Windows NT will be released by next April. Progress works with an array of leading database systems.

✆Progress: (617) 280-4000.

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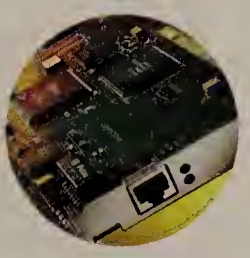
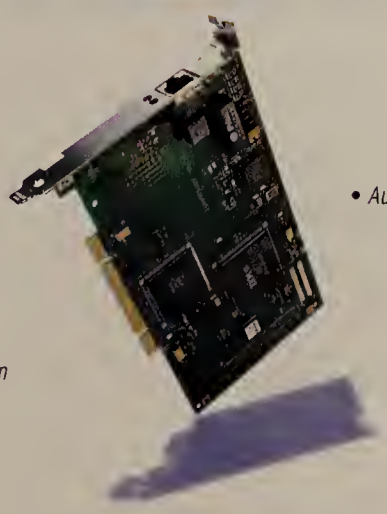
IBM Solution #22119-R  **a.k.a. "New 16/4 PCI Adapters"**



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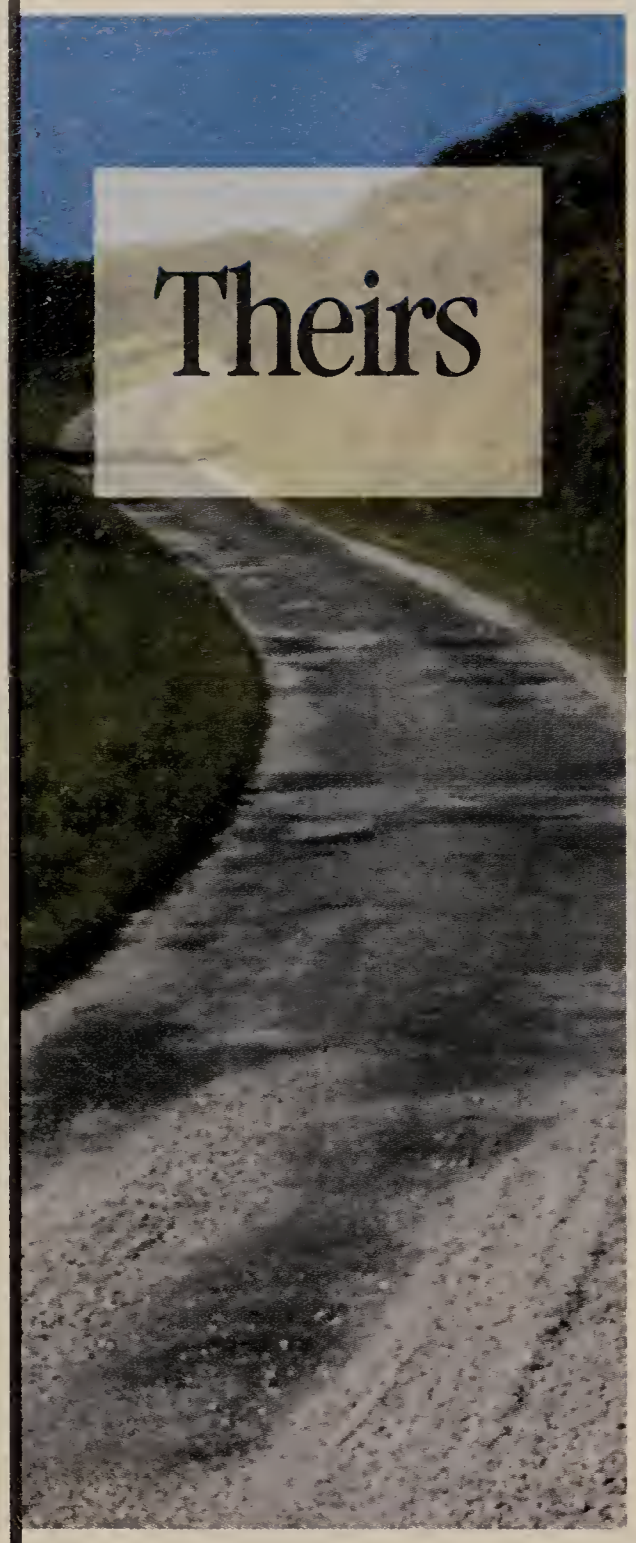
Which is the best route for your company's Internet traffic?



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Electronic Commerce

Covering: Tools and Techniques for Interenterprise Networking and Doing Business On-Line

Briefs

■ *Tokyo-based* **Webtronics, K.K.** *expects to ship by the end of the year a dedicated* **firmware Web server** *that's priced at less than $1,000 and targeted at departmental or small business sites.*

WebBox is a laptop-size unit that is managed by dial-up connections using Netscape Communications Corp.'s browser interface. The box comes with an Ethernet interface; a serial and 10Base-T interface are scheduled to be added later, said Yoshi Mizuno, Webtronics' chief executive officer.

Users set up the WebBox by entering an IP address. The unit runs on a Motorola, Inc. 68020 CPU and includes 2M bytes of flash RAM, expandable to 8M bytes.

The product is distributed and supported in the U.S. by Corporate Source of Laguna Hills, Calif.

Corporate Source: (800) 722-7748.

■ **McAfee** *has announced WebSean, a* **virus-scanning** *software that stores downloaded files in a temporary directory, where they are scanned for more than 4,000 known viruses before they are saved to disk.*

The McAfee virus software, which works with standard HyperText Mark-up Language browsers, is priced at $45. It will also be sold bundled with a CompuServe, Inc. Spry browser.

McAfee: (408)988-3832.

■ *Cambridge, Mass.-based consultancy* **Forrester Research, Inc.** *is predicting that Internet-related* **electronic commerce revenues** *will reach $46.2 billion by the year 2000.*

The Forrester report, "The Internet Economy," asserts that proficiency in Internet technology will define competitiveness not only among vendors of high-tech products, but also those in banking, retail publishing and advertising, which will have to operate their businesses on-line.

Wall Street firms collaborate to keep 'Net information secure

By Ellen Messmer

Several Wall Street brokerage firms have started to swap financial information over the Internet, but a lack of interoperable encryption products makes it harder than it should be to keep securities secure.

In response, Fidelity Investment Co., Merrill Lynch & Co., Inc., Goldman, Sachs & Co., Morgan Stanley and other firms formed the Financial Information Exchange to develop common standards for sharing information about stocks and mutual funds over the Internet.

One big problem: There are simply no interoperable security products for encrypting Multipurpose Internet Mail Extension (MIME) messages and signing them digitally.

So the brokerage houses, in search of a common messaging security format, have made due with the old Internet standby, Pretty Good Privacy (PGP). PGP software was posted on the Internet by independent consultant Phil Zimmermann to let users encrypt MIME messages.

These financial firms would like to see interoperable security features across commercial messaging products, but the market is nonexistent.

"Messaging security is the missing component in electronic commerce," said Bill Chang, manager for an encryption software project at Fidelity.

Chang is heading up an effort to issue public-key encryption software certificates to Fidelity employees for securing messages electronically. Certificates link a user's identity to a specific encryption key.

Do you trust Entrust?

Fidelity and others, such as J.P. Morgan, are now piloting Northern Telecom, Inc.'s Entrust client/server software developer's tool kit for adding encryption and signing features to E-mail. The Entrust toolkit lets companies establish an X.509 directory for storing users' public-key certificates.

Entrust is widely viewed as one of the best encryption tool kits available. But Entrust uses a proprietary messaging security API so it will not support interoperability across vendor security products. This makes it tricky for trading partners to exchange data securely without tremendous coordination efforts to ensure that everyone is using exactly the same application.

Software vendors acknowledge interoperability is a continuing sore point. A few years ago, the Internet Engineering Task Force (IETF) came up with the Privacy Enhanced Mail (PEM) standard for encrypting mail conforming to the Simple Mail Transport Protocol.

However, most experts agree that the PEM effort failed because PEM has a rigid X.509 structure that fails to meet real-world needs. Others say PEM simply died on the vine due to lack of user demand for Internet security.

Once again, vendors are taking the standards high road, this time in quest of interoperability in MIME security features they hope will meet the demands of users like Fidelity.

But the road to standards is splitting along competing paths.

The Wollongong Group, Inc. and Frontier Technologies, Inc., among others, are backing Secure MIME (S-MIME), pushed by RSA Data Security, Inc.

Wollongong and Frontier Technologies plan to have MIME products with presumably interoperable security features by year-end.

Others, like NetManage, Inc., which resents RSA's control over S-MIME, plan to implement the MIME Object Security Standard (MOSS) with non-RSA algorithms.

Both S-MIME and MOSS use Version 3 of the X.509 standard for certificate management, which is claimed to be more flexible than earlier X.509 versions.

Critics complain that the MOSS standard has too many options to foster interoperability, but TIS Vice President Steve Lipner calls those claims overblown.

A third horse in the race for interoperable mail is the Message Security Protocol (MSP) developed by the Department of Defense for the X.400-based Defense Message System (DMS).

The military hopes MSP will be adopted by the U.S. government and private sector. Like MOSS, MSP is also on track as an IETF security standard.

Lotus Development Corp., Microsoft Corp. and Enterprise Solutions, Inc. are all under contract to deliver interoperable DMS products. While Lotus and Microsoft have voiced interest in S-MIME, neither has announced products based on it.

Some vendors say they intend to support multiple messaging security protocols.

Brian O'Higgins, director of Nortel's secure networks division, said Nortel has heard requests from users for both MOSS and S-MIME, so it will add them to its tool kit next year.

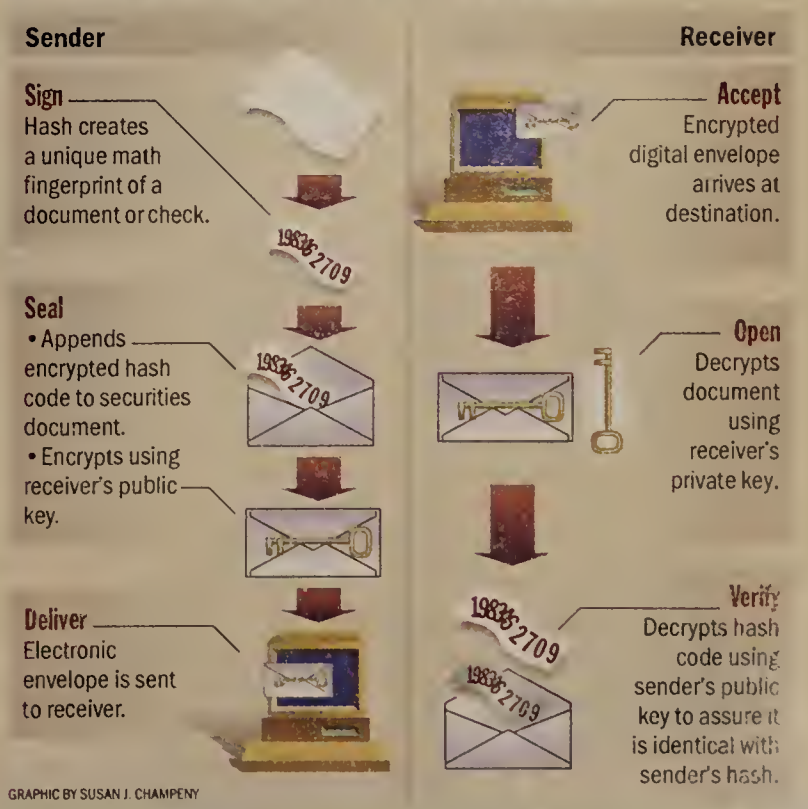
Nortel is also integrating the U.S. military's MSP into its lineup. With Nortel's help, the Canadian government next year will outfit thousands of its civilian-agency employees with encryption software that uses the MSP security API.

However, Canada will use commercial RSA algorithms with MSP instead of Capstone, the U.S. military's preferred hardware-based algorithm.

The next version of Motorola, Inc.'s PEM-based Signet secure-mail product will implement S-MIME, said Paul Lambert, formerly the chief architect of information security at Motorola Corp., who just last week joined Oracle Corp. as director of security products.

While the outcome for interoperability in messaging security products is still uncertain, vendors generally appear to believe the S-MIME standard will find more adherents than MOSS. "S-MIME is probably the horse to bet on outside the government community," said Rob Clyde, vice president of security services at Axent Technology, Inc.

KEEPING E-MAIL SAFE WITH PUBLIC KEY ENCRYPTION



GRAPHIC BY SUSAN J. CHAMPENY

BUSINESS SPACE

Mark Gibbs

Exploding marshmallows and shopping baskets

There are many Web sites that I like to show when I conduct seminars. Among them are a few obscure sites, such as Renco Encoders (http://www.renco.com) and Pacific Moon (http://silcom.com/pacmoon).

Renco has what I see as an elegant, low-cost (under $10,000) offering that is notable because it does what it should do: make data about Renco products available to customers and prospects. It isn't trying to be an encyclopedia of motion control (the business it is in) or trying to point to everywhere else on the Web.

As a side thought: This apparent desire to be an index for the Internet raises an interesting question: Why is it that so many firms want to be a mini-Yahoo? Many of these wanna-be outfits offer links to all sorts of sites that have little or nothing to do with their own business.

I guess the reason is that many Web designers believe all of that nonsense from some pundits (who shall remain nameless) about the need to be well connected and become an "information publisher." That's just more of that retro, hippie-with-mission, information-wants-to-be-free, sandal-wearing, crystal-gazing, we're-redefining-community-by-being-wired horse puckey. But I digress.

Pacific Moon, which sells pager accessories and replacement housings, is notable for the sophistication of its ordering system. Before I tell you why it's a good implementation, I must say that Pacific Moon's graphics are not to my taste.

Indeed, its corporate logo, which is a little messy even in the real world, doesn't translate well to the Web. It has lots of detail (a wave breaking over what I think is an island or a sandbar, palm tress, a moon...it exhausts me just to list all the junk in it), which doesn't work on-line.

On a computer screen, you get the equivalent of around 76 dots per inch. The result: Complex small graphics lose their detail. To me, Pacific Moon's logo on the Web looks like an island topped with an exploding marshmallow.

But leaving that aside, the underlying ordering system is one of the best I've seen. Created by my friend Frank Dziuba at Silicon Beach Communications in Santa Barbara, Calif., it has a shopping basket facility that works correctly and handles editing and display very nicely.

If you haven't come across the concept of shopping baskets before, it is the generic term for being able to browse a Web site and make a series of selections from different pages. Then, when you are ready, you can complete the order.

The reason why this is a big deal is that Web servers are "stateless" — once you and the server have completed a transaction (you: "Give me nextpage.htm," the server: "Sorry Sparky, 404"), the server completely forgets about you.

The next time you go to the server, it is, effectively, like the server has never "seen" you before. The question is, in such an environment, how do you keep track of the user's state?

The answer: by identifying each new session that starts with the server and assigning a "token" (a number that indexes into a server database) to track it. When a page is requested, the server puts the token onto the end of every URL in the page.

Next week, we'll discuss how this works in detail, but for now, check out the Pacific Moon site and look at the URLs returned in all page requests after the home page to see the tokens. And watch out for the exploding marshmallow.

I want to know which Web sites you think are really good. Let me know at mgibbs@gibbs.com or call at (800) 622-1108, Ext. 504.

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Network World *tracks down answers to your questions. Please submit them to Dana Thorat via phone at (800) 622-1108, via the Internet at djt@world.std.com or via fax at (508) 820-1103.*

How can I clear Novell, Inc. NetWare 3.12 server connections employing the monitor utility when users shut down their PCs without first logging off the LAN? Also, how can I get the workstations to reconnect without having to reboot the server?

Via Network World Fusion.

You can prevent these problems by updating your disk and LAN drivers, third-party NetWare Loadable Modules and patches on the server, says Michael Luchini, a Certified Novell Engineer and private contractor in Worcester, Mass. You'll find all the tools you need for this update on CompuServe, Inc.'s Novell forum or on the Internet at ftp.novell.com/Pub/Products/Nwos/Nw312 in the files LIBUP5.EXE and STRT13.EXE.

But, according to Novell, the inability to clear connections with the monitor utility is actually a safeguard. If you cleared connections, the moment the server initiated a critical process, such as opening, creating or deleting files, there could be unpredictable results affecting many users.

As for reconnecting, you don't have to reboot the server. Instead, modify the workstation's net.cfg file with a node address parameter, or move the workstation to a different LAN segment. Either approach changes the connection request origin and reconnects the workstation. For more information, visit Network World Fusion at http://www.nwfusion.com. From the main menu, select Forum then nwfusion.talk and Help Desk. Select Help Desk again, then Topic 6 — Network Problems.

Can you help a fellow reader?

On Oct. 9, we pointed Network World Fusion user Dave Urban to resources for finding standardized network management procedures.

Urban says the resources we referenced had useful data but did not supply a complete set of standard procedures.

If you can help, E-mail him at durban@postoffice.ptd.net.

Firewalls keep users from kicking your apps

By Peter Kolsti

They said they did it for honor, not for money. Two lads at the Royal Institute of Technology in Stockholm broke into the university network, created a bulletin board, loaded popular commercial software on it and invited users across the Internet to download the packages.

Thanks to a firewall, network administrators knew the system was breached. They checked the audit and found the students' IP addresses, names and location. Police arrested the pair.

While hackers with motives make headlines, they represent less than 20% of all network security breaches.

More common are instances of authorized users accidently winding up where they should not be and inadvertently deleting or changing data.

However, the Internet introduces another concern: Some Internet surfers are bound to go where they have no business and, in so doing, threaten to wipe out data to which they should not have access.

The ifs, ands or buts

Before picking a firewall, companies need to adopt security policies. A security policy states who or what is allowed to connect to whom or what. For example, a plan might specify that only directors, senior executives and members of the research and development group can connect to the R&D LAN.

You can group all users by department or classification. The better firewall products let you drag and drop groups in a graphical user interface (GUI) environment to easily define network security.

After defining access, the next step is to place a firewall between the LAN and the Internet. A firewall will ensure that all communications conform to your security policy.

Sizing up a firewall

Two methods are most often used together to establish an Internet firewall. They are application and circuit gateways, as well as packet filtering.

With application and circuit gateways, all packets are addressed to a user-level application on a gateway that relays packets between two points. With most application gateways, additional packet-filter machines are required to control and screen traffic between the gateway and the networks. A typical configuration includes two routers with a bastion host that serves as the application gateway sitting between them.

On the downside, application gateways are not transparent to users, applications and the gateway host on which they run. Furthermore, they are difficult to configure and manage. Only a few applications are supported and special tailoring is required.

Users must first connect to the gateway or install a specific client application for each application they expect to employ. Each application with a gateway is a separate, proprietary piece of software that requires its own set of management tools and permissions.

Circuit gateways provide a more general implementation. They only support some TCP applications and no additional protocols.

Another drawback to application and circuit gateways is that they slow network performance. This is because each packet must be copied and processed at least twice by all the communications layers.

Packet-filter gateways, which act as routers between two nets, are less secure than application gateways but more efficient. They are transparent to many protocols and applications, and they require no changes in client applications, no specific application management or installation, and no extra hardware.

Using a single, unified packet-filtering engine, all net traffic is processed and then forwarded or blocked from a single point of control. However, most packet filters are stateless, understand only low-level protocols, and are difficult to configure and verify. In addition, they lack audit mechanisms.

Most packet-filtering technologies have not addressed all security requirements. The information available for filtering (source and destination addresses and port numbers, for example) is rarely sufficient. The number of rules is limited, and there is a high-performance penalty when many rule instances are used. Lack of context or state information makes it impossible to use packet filters for datagram-based protocols such as File Transfer Protocol.

Many packet-filtering technologies also suffer from poor management interfaces. Implementing them requires a high-level understanding of communication internals and the ability to write low-level code.

Some packet filters are implemented inside routers, limiting computing power and filtering capabilities. Others are implemented as software packages that filter the packets in application-layer processes, an inefficient approach that requires multiple data copies, expensive delays and context switches, and delivers lower throughput.

Something's better than nothing

So what's a network administrator to do? Some vendors are developing firewalls that overcome many of these problems and combine the advantages of application gateways and packet filtering.

These efficient, protocol-independent, secure firewall engines are capable of application-level security, user authentication, unified support, and handling of all protocols, auditing and alerting. They are transparent to users and to system setup, and include a GUI for simple and flexible systems management and configuration.

Such products also provide secure application gateways that add value, such as user authentication. There is no need for hardware routers or cumbersome systems administration on the gateway.

They also have logging and altering mechanisms, as well as simple installation and setup procedures.

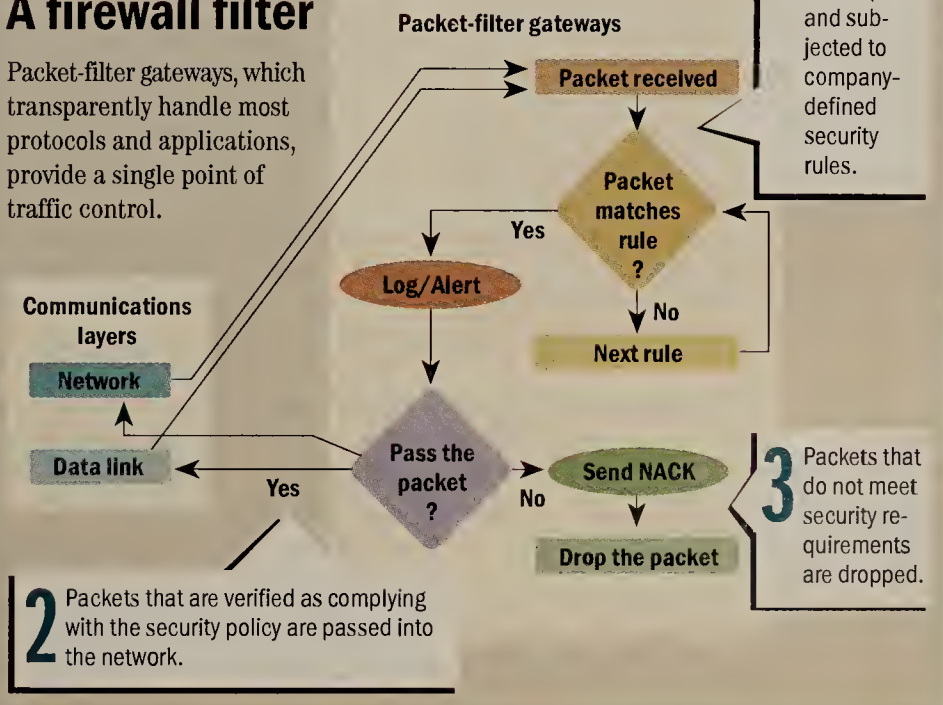
On virtually every count, it is important to pick some kind of network firewall. Just like medical insurance, it is not a question of if you will need it, but when.

Kolsti is senior product marketing manager with SunSoft, Inc.'s Internet Products Group in Menlo Park, Calif. The firm makes firewalls and other Internet products.

HOW IT WORKS

A firewall filter

Packet-filter gateways, which transparently handle most protocols and applications, provide a single point of traffic control.



EDITORIAL INSIGHTS

Avoiding the backlash

Given all the hyperbole about how the Internet will profoundly reshape the world, a backlash of fear, uncertainty and doubt was to be expected. That's the norm in popular culture and, particularly, in the press. What we hail today, we hammer tomorrow.

In the wake of reports about security problems with products such as Netscape Navigator, Chicken Littles everywhere are squawking in that "I told you so" fashion that the Internet isn't robust and we're far from achieving the promise of electronic commerce.

Trust me, it's only going to get worse. In 1996, you'll see a whipsaw effect in public sentiment about the Internet owing to more security problems and hacker intrusions, pornography and privacy fights, on-line merchandising scams and overblown reports of Internet performance problems.

So now's the time to be extra cautious, right? Wrong. While the timid blanch and quake in fear, now's the time to plow ahead with your electronic commerce strategy. All this backpedaling and doubt presents a tremendous opportunity for your company to profit. Experience bears out that every technology vision follows a pendulum curve: As the pendulum rises, it must fall back before rising again.

As a network professional, you know the security problems aren't as bad as the press and the opportunistic pundits make out. You know the Internet faces some growing pains but is getting more secure and reliable every day — particularly as the carriers, cable companies and other corporate giants get their hooks into it. You know technologies are rolling out to support secure transactions and protect copyrighted material. (Microsoft, Visa and Mastercard don't just dabble in technology.)

While others watch from the sidelines the inevitable changes ahead, smart companies like yours will already be doing business on-line. They'll be enriched with first-hand experience and strengthened by practical knowledge of electronic commerce.

You can't ignore the problems that have to be overcome in doing business on-line. But you can't be paralyzed by doubt. You have a chance to lead your company's push into electronic commerce. Take advantage of it. It could be the career opportunity of a lifetime.

John Gallant, editor in chief jgallant@world.std.com

Teletoons

By Phil Frank and Joe Troise
guru@well.com

MACROSCOPE

Preparing for a new order — When dirt cheap wireless options take over local loop

Ready for a bold prediction? Wireless local loops will become the norm within the next 10 years. Radio frequency links will replace copper wires as the media through which most business and residential users obtain voice service.

James Kobielus

Wireless carriers will provide the first ubiquitous, cost-effective competition to phone companies' traditional monopoly on switched local phone service. Sooner than you think, wireless phone service will become dirt cheap, spurred by intense competition between established cellular operators and upstart providers of wireless service in three markets: personal communications service (PCS), enhanced specialized mobile radio (ESMR) service and mobile satellite service (MSS).

Wireless services have traditionally been aimed at mobile users. But plummeting prices for the services won't coerce enough new mobile users out of the woodwork to cover PCS, ESMR and MSS carriers' investments in radio frequency spectrum licenses, network infrastructure and support organizations. Instead, fixed dial-tone services, which account for the bulk of telephone industry revenues, will stand out like a beacon of opportunity in the overcrowded wireless marketplace.

New wireless carriers — as many as a half-dozen in major U.S. markets within the next two to three years — will use price as their main tool to pry you away from cellular and traditional land-line service providers.

Flat-rate monthly pricing will become commonplace throughout the wireless industry. Providers will practically give away dial tone in order to supply value-added premium services such as enhanced paging, electronic mail, real-time news feeds, Internet/World-Wide Web access, security monitoring and remote telemetry.

In most respects, you will come to regard cellular and competing wireless services as interchangeable commodities that are substitutable not only for each other, but also for land-line telephone service. All wireless services will offer small, portable, battery-powered handsets. Signal coverage will be universal, handoffs seamless and roaming transparent. Audio quality will be no worse than that of today's typical long-distance call. Wireless data communications speeds will be comparable to land-line transmission rates.

With this radical industry restructuring on the horizon, you should start now to reevaluate the roles of wireless and wired access loops for your company. Carriers will offer wireless and wired connections as complementary rather than mutually exclusive alternatives. Already, every traditional land-line carrier worth mentioning provides or is planning to offer PCS and cellular services.

How should you migrate your corporate network to this new telecommunications order? At first, wireless-only voice connections will be most appropriate for special applications, such as flexible service provisioning for temporary, small and remote sites.

As more of you install wireless PBXs and in-building PCS cell sites, the main corporate locations will convert to wireless loops. In the new order, you will have the unenviable chore of ensuring adequate propagation of wireless signals within office spaces, which is anything but an exact science. You will also be responsible for ensuring seamless handoffs between in-building and metropolitan-area wireless networks. In addition, corporate voice messaging systems will have to be integrated with wireless carriers' switches to ensure coverage for incoming calls to out-of-range or switched-off voice terminals.

Our massive societal investment in twisted pair will not become obsolete. Instead, it will be used to support bandwidth-intensive video, multimedia and Internet/Web traffic. Phone companies will migrate voice traffic to wireless loops to make way for more lucrative entertainment services.

Pundits who predict that cable television companies will make a strong showing in the local-exchange voice communications business have got it all wrong.

This trend will mark the realization of the "Negroponte flip," prophesied years ago by Massachusetts Institute of Technology Media Lab director Nicholas Negroponte. He predicted the eventual migration of traditional wire-line traffic — especially voice and low-speed data — to wireless networks and the concurrent migration of video, audio and other high-bandwidth traffic to wire-line networks, such as cable television and Asynchronous Transfer Mode.

Pundits who predict cable television companies will make a strong showing in the local-exchange voice communications business have got it all wrong. Wireless local loops can be provisioned in a fraction of the time and for less than the expense needed to retrofit existing coax or fiber-based cable TV networks with full-duplex capabilities.

Some observers doubt whether wireless networks can scale up to mass-market penetration due to capacity limitations associated with the scarce radio frequency spectrum. However, wireless network engineers have that problem on the run, utilizing microcell architectures, code-division and time-division multiple-access protocols, and improved voice-compression techniques to unfurl more calling capacity out of the airwaves.

The wireless industry is up to the challenge of providing fixed local-loop services to the mass market. Popular culture has already embraced the idea of cordless telephony in the home, office and great outdoors. It's only a matter of time before you catch the wave and untether every phone on every desktop.

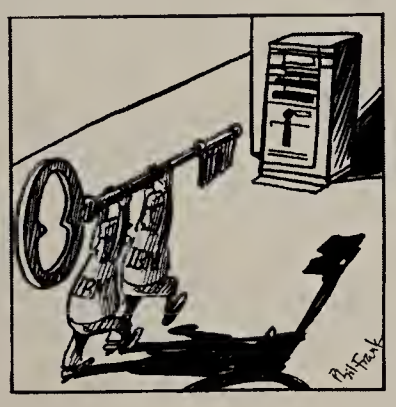
Kobielus, a contributing editor to Network World, *is a senior telecommunications analyst with LCC, L.L.C., an Arlington, Va.-based network design and engineering firm. He can be reached at (703) 807-5075 or via the Internet at kobielus_james@lccinc.com. The opinions expressed are his own.*

IBM NETWORKS

Big Blue offers a new key to host access

Lynn Nye

IBM has announced its next-generation front-end processor (FEP), the Nways 3746 Model 950 controller, which puts rivals on notice that IBM is more than ready to compete. By eliminating the requirement that you license IBM's Network Control Program (NCP), Big Blue has addressed the price/performance penalty and limited functionality that has forced you to look at alternative offerings from competitors such as Cisco Systems, Inc. Therefore, this announcement couldn't have come at a better time if you're looking to migrate your SNA Subarea network to a next-generation net, whether you're planning to use frame relay, Advanced Peer-to-Peer Networking, IP or any combination of these.



The Model 950 addresses a real need for a replacement to IBM's 37X5 approach for gaining access to host systems. The role of the FEP is evolving quickly, forcing you to use application-specific channel access devices to meet your requirements. The 950 puts in place a product and architecture that meets these requirements while providing the means to implement a realistic migration plan.

Although migration requirements are specific to each network, there are a set of functionalities that meet the needs of the majority, which include support for established Subarea SNA (via Synchronous Data Link Control, token ring and frame relay), TCP/IP and Advanced Peer-to-Peer Networking. Something tightly integrated, but often overlooked in planning, are the networking requirements for workstations gaining access to the host via 3270 client emulation packages and SNA gateways.

Let's deal with SNA first, since it is still a critical networking requirement. Just as IBM has historically done, it is releasing functionality in line with your needs, which dictate support for SDLC and token ring first. Since the Model 950 functions as an APPN Network Node, it delivers SNA support via the dependent LU Requestor and dependent LU Server mechanism for transporting subarea traffic in an APPN network.

While SDLC and token ring will meet the majority of today's needs, some of you are greatly interested in future releases of the 950 software that will support frame relay for both SNA and routed IP traffic. But in terms of dealing with existing subarea traffic flows, the 950 appears to be ready for action.

If your functional needs are accessing IP-based application resources on the host, then you might be surprised by what you find in comparing the 3746/950 with the channel-attached router from Cisco. If you only need to support IP connections (rather than IPX or AppleTalk), you would be hard-pressed to find any functional difference between a Cisco or IBM channel-attached IP router.

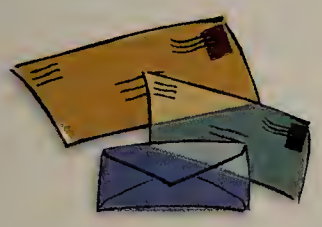
Interestingly, both IBM and Cisco are staying out of the trend toward using centralized SNA gateways. Both companies appear to support a "native" access device (tn3270 for Cisco and SNA for IBM). In the meantime, the most common alternative to centralized SNA gateways is channel-attached SNA gateways, such as SNA Server from Microsoft Corp. In these configurations, all the logical unit traffic flows through the gateway and has no need for the services provided by either the 950 or a channel-attached router.

Although early players have made a living delivering channel-attached SNA gateway platforms, a new player, Polaris Communications Inc. of Beaverton, Ore., is coming on strong with PCI platform products supporting bus-and-tag channels as well as Enterprise Systems Connection (ESCON). Its PCI implementation enables an application, such as Microsoft's SNA Server, to operate in a high-performance platform and attach directly to the host on ESCON connections. This opens the door for combinations of SNA Server and the Polaris gateway, supporting thousands of users on one channel-attached PC platform. This results in more than one type of channel-attached host gateway: either the Model 950 approach for native SNA, APPN or even IP traffic, or an SNA gateway from Microsoft running on a Polaris platform.

Without a doubt, IBM and Cisco both have their work cut out for them. But don't get caught up in the hysteria surrounding the challenge to IBM from Cisco and others for host access. Cisco became popular because of its ability to support a wide variety of protocols over different media. But remember the hoopla when Cisco announced Advanced Peer-to-Peer Internetworking and support for PU4? What happened to those?

IBM has been around the block more than a few times. And the Model 950 will undoubtedly take the company around again.

Nye is president of NetResults, a consultancy in Portland, Ore. He can be reached at (503) 788-1771 or via the Internet at 71334.1270@compuserve.com.



IN-BOX

WMC efforts misunderstood

James Kobielus' column on workflow standards (Sept. 11, page 50) shows a fundamental misunderstanding of the objectives and efforts of the Workflow Management Coalition (WMC).

The WMC is not defining a standard for the construction of workflow management systems. What it is doing is defining a standard set of interfaces for workflow management systems.

This standard's interoperability protocols and formats will support the cooperative operation of different workflow systems, regardless of who the vendor is, what product architecture is used or the physical location of the workflow management system.

This means that both inter- and intra-company connections between workflow API-compliant workflow systems are a possibility.

This fact belies Kobielus' assertion that the WMC standardization approach is fundamentally weak because it focuses strictly on workflow processes within the same corporation.

Kobielus also doesn't seem to understand that the Workflow Reference Model is a generalization (although still very functional) of the capabilities one might find in a workflow management system.

It is asking far too much of the WMC to develop process models for vertical markets.

Finally, anyone can comment about the directions the WMC takes. Please feel free to contact the WMC Secretariat, Alfons Westgeest, at 100113.1555@compuserve.com for a schedule of upcoming meetings.

Mark Tucker
Business analyst
National Life of Vermont
Montpelier

The author responds: On the whole, the WMC has crafted a useful framework that standardizes how the industry describes workflow technologies. Nothing's perfect, though.

The WMC is defining workflow program interfaces, but not a very critical interface, through an industry-standard EDI transaction set for interchange of process models between two or more enterprises.

The WMC's reference model certainly enables sharing of process models between dissimilar workflow systems.

Naturally, having been developed for separate applications, EDI and workflow technologies are not yet interchangeable. But they will increasingly become so in this age of flexible, virtual organizations.

Today's tightly integrated corporate subsidiary might be spun off into a separate firm tomor-

See **In-box,** *page 72*

WHAT'S WRONG

By now, corporate America was supposed to be largely untethered but still very much in touch. Here's why it hasn't happened.

By Elisabeth Horwitt

After an internal study predicted major customer service improvements if sales reps could get inventory levels, pricing and product specs from the road, Wilson Sporting Goods, Inc. three years ago gave its salespeople laptops and modems to access the corporate AS/400 via ARDIS Co.'s packet radio network.

Enthusiasm was high at first, but users soon started reporting problems, says Richard Mullings, manager of IS for the Chicago-based manufacturer. "We have people in the heartland of the U.S. and up north who had trouble finding [an ARDIS] node," he says.

Sales reps were unable to transmit out of certain buildings unless they stood near a window and sometimes lost data or sessions. Some were only connecting about 50% of the time. "There was a user backlash," Mullings says.

Interest waned, and utilization levels dipped. Ultimately, the project was abandoned.

Wilson is one of many firms that see major paybacks from wide-area wireless networking but are put off by the technology's drawbacks and limitations.

The fact that wireless networks still cost far more than equivalent wired offerings is only part of the problem. Other obstacles cited by users and analysts include lack of reliability, spotty accessibility, sluggish transmission rates and difficulty integrating wireless with existing network applications and infrastructures.

On the wireless LAN side, too, the main implementation obstacles have been high costs, low data rates and lack of killer applications to make deployment worthwhile (see story, opposite page).

"Clearly, there has been an overhype of the industry," says Daniel Merryman, director of global and wireless communications for BIS Strategic Decisions, a research firm in Norwell, Mass. "[Vendors] underestimated the complexity not just of rolling out [wireless] services, but of creating a complete hardware, application and communications infrastructure solution, plus distribution channels that create an awareness in the user population. Now we are going from the hype phase to the reality phase."

Consider these realities:

- RadioMail Corp., a leading wireless electronic mail provider, has fewer than 3,000 subscribers.
- AT&T Wireless Services, Inc., formerly McCaw Cellular Communications, Inc., reports that data makes up only 1% to 3% of the traffic on its cellular network (*NW*, Oct. 23, page 10).
- As of last month, Cellular Digital Packet Data (CDPD) services offered coverage comparable to analog cellular services in only 26 of the nation's 306 largest metropolitan areas (*NW*, Oct. 16, page 8).
- RAM Mobile Data has announced the elimination of flat rates for its wireless E-mail service, effectively putting them

special section

Wireless Networks

PICKING THE BIGGEST WIRELESS STUMBLING BLOCKS

"Standards. They are completely up in the air, from handheld devices to software APIs to air interface protocols. It's hard to compete with other projects in-house for funding when you can't assure management that the components of your project won't be obsolete in six months."

Helen Kulas, information technology project leader, Northern States Power Co., Minneapolis

"High costs and a lack of applications that take advantage of wireless networks."

Jim Tracey, facilities management and restoration systems supervisor, Florida Power & Light Co., Juno Beach, Fla.

"E-mail failed as the killer application, networks have been selling against each other before there is a market to fight over, and there are too many confusing communications choices."

Andrew Seybold, editor, "Outlook on Mobile Computing" newsletter, Boulder Creek, Calif.

"Too much integration work has been left up to the customer."

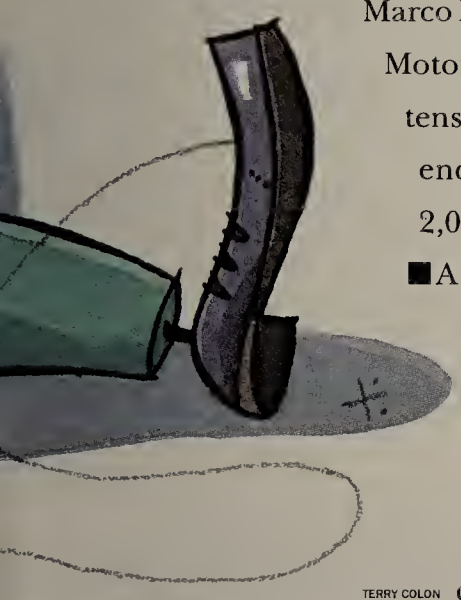
Phil Schultz, wireless project director, Chicago Board of Trade

PHOTOS BY MARK ESCHER

WITH WIRELESS?

beyond the price range of many users. This is evidence that the company is retreating from the horizontal market and concentrating on vertical sectors, according to one analyst.

■ Motorola, Inc. laid off an unspecified percentage of its Wireless Data Group, which is responsible for the Envoy and Marco Personal Digital Assistants. Motorola's business plan was to ship tens of thousands of units by year-end; so far it has shipped about 2,000.



TERRY COLON

■ A survey of 101 companies with mobile workers doing remote access finds only 22 had equipped any of those workers with wireless capabilities. Thirty-two respondents said they expected some mobile workers to be using wireless links by 1997, according to Infonetics Research, Inc., the San Jose, Calif., firm that conducted the survey.

The overall number of wireless users is minuscule, researchers say. A BIS report estimates the total wireless WAN user base at 802,000 this year, up from 503,000 last year but still only 2% of the total potential subscriber pool. BIS estimates that pool to be 38 million — 31 million mobile professionals and seven million in the field service and sales, transportation and public safety sectors.

The report predicts the wireless industry will start taking off in the next couple of years, reaching an installed base of 9.9 million users by the year 2000 (see graphic, page 68). By then, the total potential wireless subscriber pool will grow to 41 million, BIS estimates. (Those figures do not include consumers, which would have to include the entire population, nor telemetry and point-of-sale applications, which target devicees more so than people.)

The major drivers for the wireless market will not be cost savings as compared to wired nets, as was once the prevailing wisdom, but a rising demand from roving and hard-to-reach users to access or share information on a real-time basis, Meryman says. That pool of potential users includes the entire U.S. mobile workforce, which BIS estimates at 45 million.

Continued on page 68

Users wary of wireless LANs

Participants in seminars conducted by Modern Technologies use laptops attached to a Xircom Corp. NetWave wireless Ethernet LAN. Portable Novell, Inc. NetWare servers running Ventana's Group Systems V software allows attendees to "sit at their notebooks and enter comments anonymously, instead of raising their hands," according to Harry Powell, IS manager for the Atlanta-based consulting firm.

The company also uses NetWave internally for meetings. Managers can express their opinions freely, knowing that "it'll be anonymous; the executive just knows it's coming from a particular group," Powell says. "It really opens up communications."

Modern Technologies, however, is an exception. Wireless LAN technology, like its wide-area counterpart, has yet to claim big numbers of such converts.

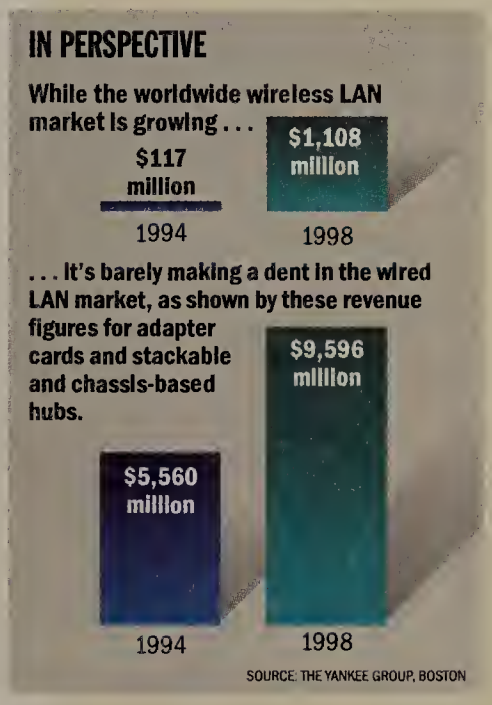
"It would be neat if I had a PC and could go into a boardroom and get linked" to corporate network resources, says Robin McCubbin, network planning analyst at National Grocers Co. "But it comes with a price tag, and do I really need it? The answer is no."

Some 10 years since the technology first appeared, the wireless LAN industry is "still in its early stages" in terms of pricing, functionality and standardization, admits Phil Bellinger, vice president of leading wireless LAN vendor Xircom.

Most wireless LAN adapters cost around $600, as compared with about $200 for a PCMCIA-wired Ethernet board. The continued lack of wireless LAN adapter standards has kept the price up, and scared off users that want the flexibility to mix and match wireless LAN equipment, and to switch vendors down the road.

That picture is due to change in the finalization of the IEEE 802.11 wireless LAN adapter standard is finalized next year, but other problems will remain — bandwidth being chief among them.

The typical wireless LAN data rate is only 1M bit/sec, although Bellinger says, "10M bit/sec is still the magic number." Such speeds are technically feasible, he says, "but only if you operate in the same room."



Indeed, RadioLAN Corp., which had originally promised to deliver 10M bit/sec wireless Ethernet this year, has gone back to the R&D drawing board, according to one industry spokeswoman.

The 802.11 standard also will pave the way to lower prices through mass-produced chips, Bellinger says. Indeed, Xircom recently lowered its NetWave wireless LAN adapter prices from $599 to $399 in anticipation of the standard.

However, vendors need to get prices down to $150 if they want to see wide-scale deployment, says Bill Frezza, president of Wireless Computing Associates, Inc., a Yardley, Pa., consultancy.

And client/server wireless installations also need access points to coordinate communications in a given area. Xircom's product is priced at $1,499.

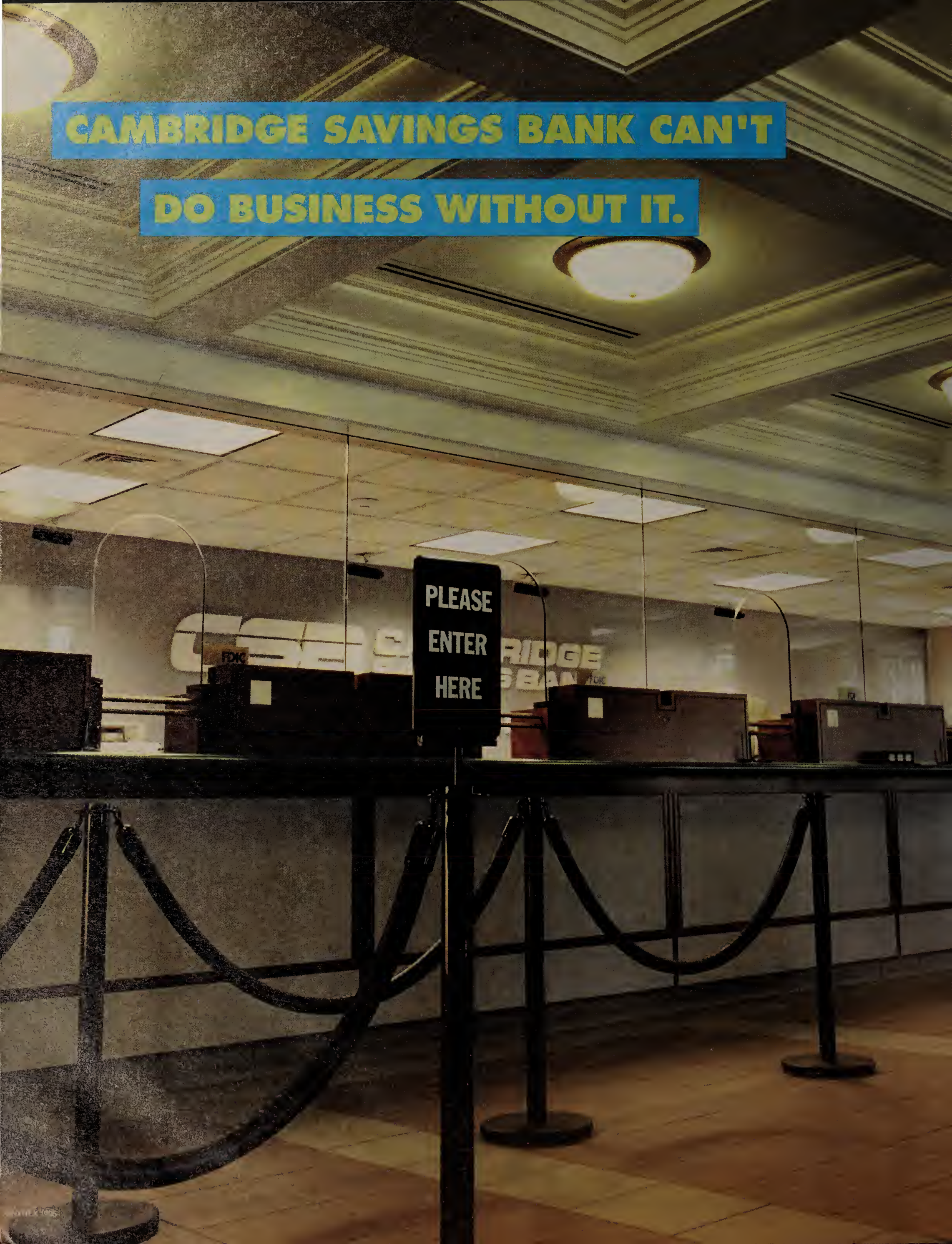
The bulk of current wireless LAN users have specialized, vertical applications that would not be possible without the technology, Bellinger says.

For example, doctors and nurses now use wireless LANs to access hospital systems, record patient visits and procedures, and call up patient records and laboratory results from anywhere in a medical facility.

Warehouse management systems such as the one implemented by Esselte Pendaflex Corp. are another classic wireless LAN application (see main story).

Users with such specialized needs are "willing to pay that price premium," according to Bellinger.

By Elisabeth Horwitt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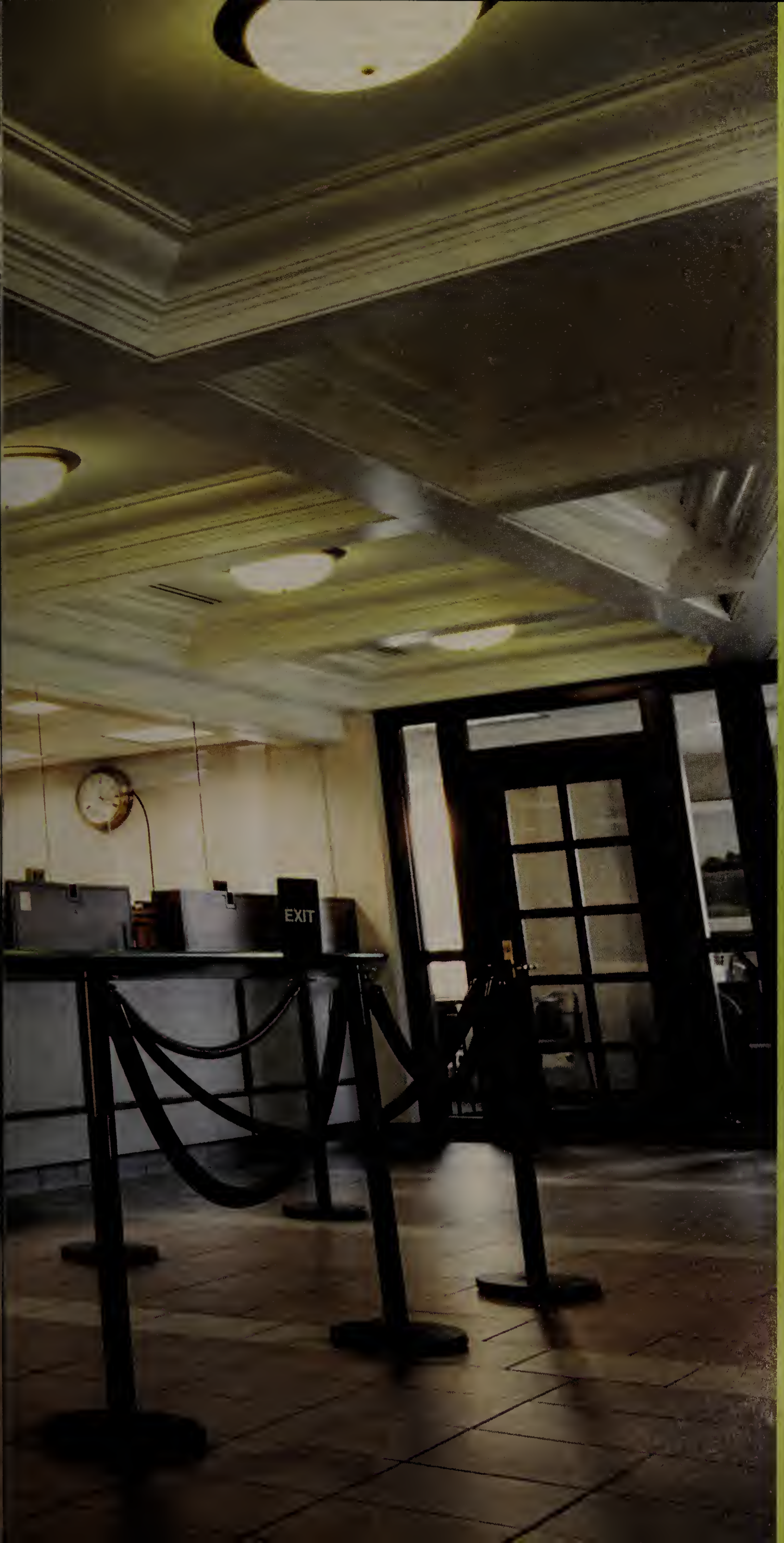

IT?

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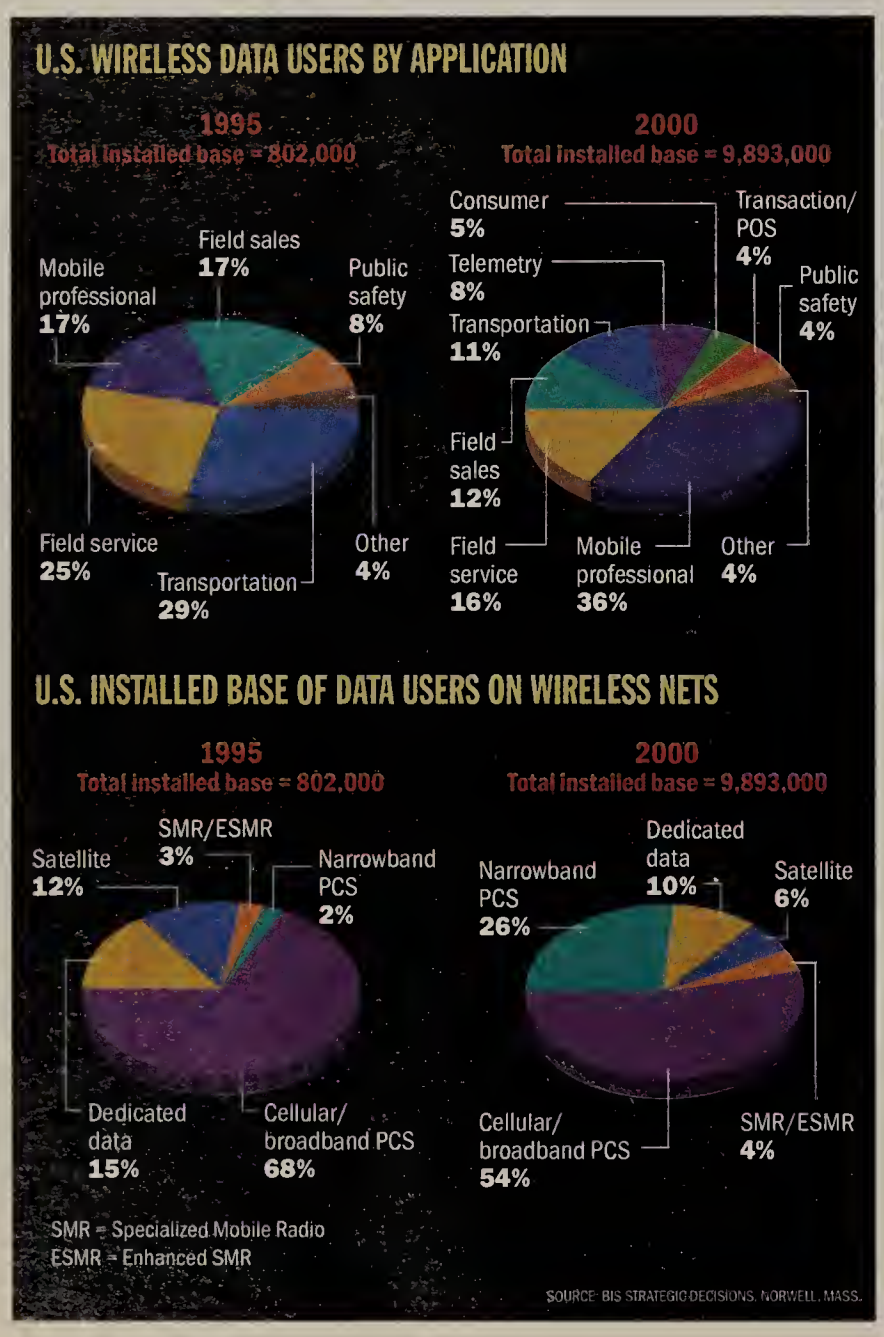
Circle Reader Service #62

Continued from page 65

An overwhelming majority of mobile workers who currently use wireless links are in specialized vertical areas, the BIS report says. Among them are field sales and service representatives who use wireless links to call up product specs and price lists, as well as customer service representatives at financial and consulting firms who use the technology to access a customer's account record or check a company's financial profile, for example.

One growing market sector is fixed telemetry: radio frequency receivers in utility meters or building security systems that can be read from a truck on the street or even from a central location.



However, the wireless industry has yet to get a toehold in one major horizontal niche: laptop-toting white-collar managers checking their E-mail and getting project status updates from the road. Indeed, these so-called road warriors made up only 17% of the total wireless WAN user base in 1995, BIS says.

Doubting Thomases

But wireless technology is not without benefit. In fact, users report that certain vertical wireless applications have paved the way to major gains in productivity (see story, page 70). The problem is many potential customers are still unconvinced that the payback will be worth the trouble and expense of implementation.

No one knows this better than Marc Alter.

A few years back, Alter spearheaded the implementation of a major new warehouse management system as manager of distribution information systems at Esselte Pendaflex Corp., an international office equipment manufacturer whose U.S. division is based in Garden City, N.Y.

The heart of the system was radio frequency links between a Stratus Computer, Inc. host running the custom warehouse management application and handheld RF devices operated by the warehouse workers. "We used RF to prompt [warehouse workers] to the right location to pick up the right product," Alter says. "The system also allowed us to track orders through each warehouse, from incoming to shipping."

The bottom line: Esselte Pendaflex realized 99.9% inventory accuracy and a 30% increase in labor productivity.

Alter now makes his living trying to convince others of the

wonders of wireless as vice president of client services for NSA Computer Exchange, a value-added reseller in the distribution industry.

When push comes to shove, he says, many prospects back down. "We found that when we put together a price configuration, most of the systems cost $100,000 and up. And most of our customers — distribution companies in the $20 million to $600 million range — found this too expensive for their budgets."

A major budget-breaker is the need to implement an integrated warehouse management system to utilize the data collected by the RF terminals in the warehouse, Alter says. "You need to customize it to the company's operations, and you are often dealing with people who have little computer experience and no RF experience." The task of implementing just the RF and barcode part "is a project in itself, taking between two months and a year," he says.

Doing the math

That translates to high costs, which goes hand-in-hand with snail-like transmission rates as two of the biggest reasons why wireless has not yet taken off and probably won't for several years, analysts say. Right now, users are expected to pay 10 times the cost of wired long-distance links for a fifth of the performance, says Bill Frezza, president of Wireless Computing Associates, Inc., a consultancy in Yardley, Pa.

Take the two leading national packet radio network providers, ARDIS and RAM Mobile Data. For most users, ARDIS' service tops out at 4.8K bit/sec. The company recently began installing 19.2K bit/sec links in some areas but has no plans to upgrade existing lines, says Rob Euler, senior vice president of ARDIS. RAM supports 8K bit/sec rates and has no upgrade plans, a company spokesman says.

On the cost side, internal wireless laptop modems cost between $500 and $700, as compared with about $200 for dial-up telephone modems that operate at 14.4K bit/sec or better.

However, the real financial bite comes from transmission charges of about 30 cents per kilobyte.

These high costs and slow speeds make such wireless links impractical for bandwidth-intensive applications such as large file transfers and surfing the World-Wide Web. Existing host and client/server applications, as well as transport protocols such as TCP/IP, were not built to run reliably or cost-effectively over wireless links. Users end up paying dearly for overhead such as repeated acknowledgements, Euler admits.

There is an emerging class of middleware that helps you manage end-to-end wireless connectivity and trim the fat off transmissions (see story, this page), or you can develop your own wireless applications from scratch. Neither of those options comes cheap. A wireless installation that includes middleware runs $40,000 to $50,000 to support 300 users, Euler says.

Given those figures, it's a small wonder that many potential users are backing off from wireless.

"I tried using [Ericsson Radio

Continued on page 70

Middleware: Key to road warriors

The vision looks something like this: An executive armed with a wireless personal digital assistant or laptop checks the status of a project, arranges a meeting, updates some files and downloads news briefs from the Web — all while sitting in a taxi or an airport.

The problem is making wireless technology user-friendly and cost-effective enough to win executives over, analysts and users say.

Less expensive internal wireless modems have helped, but more crucial and difficult is integrating wireless seamlessly with white-collar workers' desktop environments, such as messaging, groupware and database services.

Mid·dle·ware: Software that acts as a translator between an application and the underlying network transport protocols it employs.

Fortunately, help is on the way in the form of a growing body of middleware software designed to enable legacy applications to work over wireless without the need to rewrite them.

Packages from companies such as Sybase, Inc., Oracle Corp., and Walker, Richer & Quinn, Inc. take care of end-to-end connectivity issues, such as reliability, security and overhead. Some reset wireless links when they go down and deal with the overhead of traditional transports such as TCP/IP that can quickly overburden wireless circuits.

Among the promising recent developments:

- The release of Motorola, Inc. Wireless Data Group's Airmobile Wireless Software for cc:Mail, which has middleware capabilities that include filters to let users download partial messages. It supports both Ardis Co. and RAM Mobile Data networks.
- CompuServe, Inc.'s announcement of an agreement with paging network provider RPA, Inc., which will enable RPA pager users to access their electronic mail via CompuServe.
- Sybase's announcement of a wireless middleware platform that will support applications written to Novell, Inc.'s Message Handling System, Vendor Independent Messaging and Microsoft Corp.'s Messaging Application Programming Interface (MAPI).
- Ericsson's unveiling of a wireless platform for Windows 95 and Windows 3.11, said to enable applications written to Open Database Connectivity and MAPI to run over wireless. General availability is scheduled for April 1996.

Conspicuously absent from the wireless revolution, however, are industry heavyweights including IBM/Lotus Development Corp., Microsoft Corp. and Intel Corp.

Microsoft is "sitting it out, waiting for high-speed networks" that will support big-bandwidth applications, says Andy Seybold, a wireless consultant and editor of "The Outlook on Mobile Computing" newsletter in Boulder Creek, Calif.

Lotus' cc:Mail Mobile is reported to work well enough over wireless. But a company spokesman says Lotus has no immediate plans for a more wireless-oriented Notes.

Lotus — like many of its competitors and customers — is waiting for the wireless market to mature in terms of service availability, higher throughput and lower prices, the spokesman says.

By Elisabeth Horwitt

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FREE Product Info

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Systems, Inc. wireless] Mobidem modems to pick up my cc:Mail messages, and I was lucky to get [data rates] of 4K bit/sec," said John Dubiel, manager of planning and technology for Boston Edison Co. "If someone is sending you a 90K-byte mail message, this makes you very unhappy."

Indeed, during the two-year period that the Boston utility tried out wireless E-mail, managers increasingly turned to the telephone jacks in their hotel rooms, so they could transmit at 19.2K bit/sec. The speed differential, coupled with high equipment costs and the need for users "to tote around a 5-pound brick," caused Boston Edison to "largely discontinue" its wireless E-mail project, Dubiel says.

Coverage woes

CSX Transportation ran into another long-standing limitation of wireless networks when it implemented ARDIS' wireless service to transmit work orders to the crews that load and unload its trains (*NW*, July 10, page 20).

It turned out that ARDIS' packet radio network only reached 80% of these locations, some of which were in remote, sparsely populated areas. That meant the host computer responsible for dispatching orders lost communications with trains on a fairly regular basis, a CSXT spokesman says. The company plans at some point to look at options for supporting the remaining 20%, which he says may mean changing carriers.

While both ARDIS and RAM Mobile Data continue to add coverage to metropolitan areas, coverage of remote areas remains problematic. RAM last month announced it plans to partner with large customers that need coverage even in remote areas, such as utilities, to help finance the deployment of additional nodes.

In addition, RAM just announced it will give users the option of using ordinary telephone lines, circuit-switched cellular and satellite links to hook into its network when they are out of typical range. ARDIS already provides that option. Modem makers such as Novalink Technologies, Inc. and Rockwell Corp. are bringing out products that can support both wireless and other types of connections.

The CDPD promise

A number of users, including Mullings of Wilson Sporting Goods, are hoping the emerging CDPD services will meet their wireless needs.

"It's apparently much cleaner [than services such as ARDIS or RAM]," he says. "This time, we'll do a controlled beta and get better documentation of the coverage area."

The CDPD market finally got off the ground this year with services offered by national carriers such as Sprint Corp., GTE Corp.'s Mobilenet division and AT&T Wireless Services, as well as regional carriers such as Bell Atlantic Corp. and BellSouth Corp.

Among the promised benefits of CDPD is reliable 19.2K bit/sec data transmission and easy access to the Internet through built-in support of TCP/IP. While CDPD modems cost $100 or $200 more than equivalent packet radio modems, prices are likely to shake down in the next year. And despite gargantuan start-up costs, some CDPD carriers are underpricing ARDIS and RAM on transmission rates, charging between 10 cents and 25 cents per kilobyte.

But given the high start-up costs, which stem from the need for special packet-switching equipment on top of existing cellular radio towers, analysts and users report some carriers are just starting out on the deployment curve, with several regional carriers dragging their heels. Furthermore, carriers still have to work out commercial arrangements so that one provider's customer can get coverage in another's area.

Personal communications services (PCS) is another emerging wireless industry sector that promises everything from high speeds to low costs, but Frezza says it is unlikely to deliver for four or five years. PCS providers are still negotiating with microwave network users occupying the spectrum that the PCS industry wants to employ.

A second problem is the standards battle that has fragmented the PCS market into proprietary enclaves. And PCS vendors also have a massive deployment effort still in front of them.

The tried and true

Given this state of flux of more advanced services, one likely path that would-be wireless users will take is toward "regular old circuit-switched cellular" telephone networks, Frezza says. Such services have the reach into remote areas that other offerings lack, modems only cost about $300, and middleware is unnecessary. Carriers charge by connect time and not by byte, making the medium cost-effective for regular business applications and file transfers.

Armor All Products Corp. is one case in point.

For the past few years, Armor All sales reps on the road have used regional circuit-switched cellular links to pick up cc:Mail and Internet messages, as well as to access the corporate host, with hardly a glitch. Costs have stayed within bounds while complaints

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special section
Wireless Networks

HOW TO GAUGE IF WIRELESS IS FOR YOU

Implementing a wireless application makes sense right now if:

1. It offers major potential paybacks and can't be done without wireless.
2. Potential users are committed and enthusiastic.
3. Users are technically savvy and realistic about possible glitches during ramp-up.
4. The application has its own recovery features or is not sensitive to occasional loss of data or sessions.
5. File transfers, graphics or other bandwidth-intensive interactions are not involved.
6. Users and implementation sites are in major metropolitan areas.
7. Upper management has approved all necessary components, including equipment, training, middleware and/or software development, plus a hefty margin for the unexpected.

If your application doesn't meet all of the above criteria, don't worry; you may still opt to go ahead, particularly if numbers 1 and 2 strongly apply.

Keep in mind, wireless technology is changing rapidly; some of the above criteria may not apply in as little as six months.

Coupon king is sold on wireless technology

You know those fat, colorful "Super Coups" envelopes you get in the mail every so often stuffed with coupons? Wireless technology is instrumental in bringing them to your door.

Ordinary wireless cellular telephone links have enabled Super Coups producer The Mailhouse, Inc. to boost productivity by 300% for more than half its sales transactions, says James Havens, manager of IS for the Avon, Mass.-based company. Now The Mailhouse wants to apply those productivity benefits to the remainder of its business, he says, probably by using the new breed of Cellular Digital Packet Data (CDPD) services.

The Mailhouse represents one of the success stories that the wireless industry needs far more of in order to ignite.

Super Coups, in case they haven't yet come to your area, are packets of 30 to 40 coupons offering cash discounts from various merchants in a given area. The Mailhouse sells the coupons to local merchants through franchises located in major metropolitan areas around the U.S.

Until recently, the merchant perused a catalog of designs and composed the advertising text on paper. The salesperson then faxed the text to The Mailhouse headquarters, where it was manually keyed or scanned into the computer system. Proofs might be faxed back and forth several times before the final sign off by all parties. The whole process took about three weeks, Havens says.

Under the new system, merchants can choose from various predefined color coupons displayed on the salesperson's laptop. Customers agree to text on the spot, and the salesman pastes it into the design. When the merchant is satisfied, the salesperson strips the text off the design, hooks his laptop into his cellular phone and transmits the text wirelessly to The Mailhouse host.

"Since the merchant has already seen the coupon, the data enters the system pre-approved and proofed," Havens says. It then goes right to the art department to get production rolling. The whole process takes a week instead of three and frees up more time for salespeople to sell coupons.

The setup has only one major drawback, according to Havens. "We found that the highest we could go [on circuit-switched cellular links] with close to 100% reliability is 1200 baud — a crawl."

James Havens *claims wireless cellular phone links enabled his firm to increase productivity by 300%.*

That's adequate for transmitting text, he says, but not graphics. When, as often happens, a merchant wants to add something to the coupon prototype — such as a product photo or company logo — the new material must travel to The Mailhouse's production system via the old, slow fax channel.

This is why Havens foresees a migration in the not-too-distant future to CDPD, with its 19.2K bit/sec data rate. This will enable merchants "to be more creative, change artwork, put in their own logos" and still make use of the accelerated wireless approval process, he added.

Unfortunately, CDPD services will not be viable to The Mailhouse until they can be accessed by salespeople at most customer sites. "Right now, you can use [CDPD] in metropolitan areas but not in East Overshoe."

Still, "about 50% of our work is repeat work, so that 300% gain in productivity can be applied to a large portion of the work we do," Havens says.

By Elisabeth Horwitt

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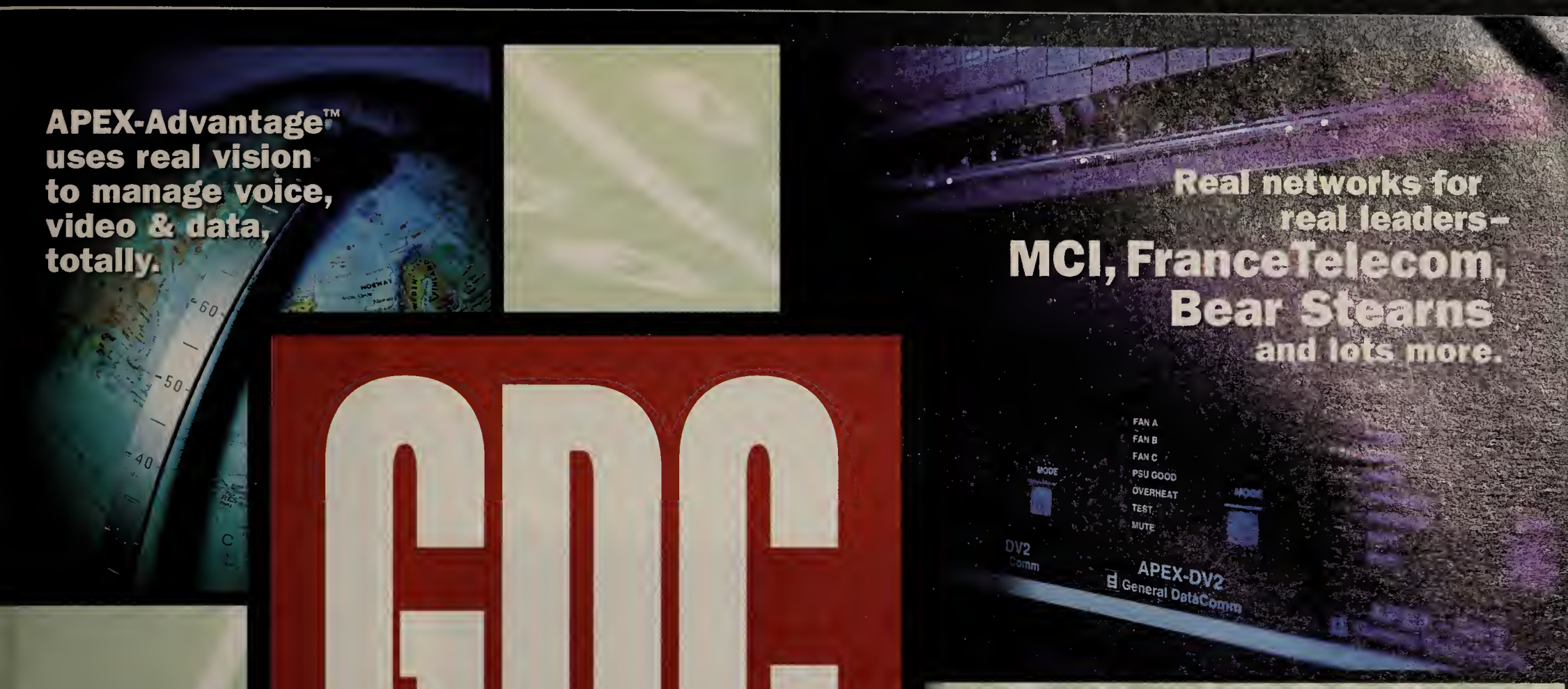

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General DataComm

Continued from page 70

of data or connection loss are virtually nonexistent, according to Walt Hadzinsky, vice president of information services for the Eliso Viejo, Calif.-based car and home care products manufacturer.

"When sales reps land in an airport, they don't have to race to a phone; they get in the car, get the laptop out, get E-mail messages, look up today's orders, find out what's shipping next month," he says. "It's not just E-mail or paging; it's whatever you want to get to. It works well."

special section

Wireless Networks

For every success story like Armor All, however, there's a company like Hewlett-Packard Co. After evaluating several types of wireless service, HP executives on the road decided to go on "plugging their laptops into the telephone," says Prashant Karnick, director of enterprise networking for HP's professional services division. "We found that the latency built into TCP/IP-based applications caused time-outs" when network delays lasted too long.

While CDPD services get around the time-out problem, "only five towns [near] San Francisco have CDPD, and the charge per byte is high," according to Karnick.

What many users are waiting for is the ability to move from wired to wireless with only a 10% cost penalty and a 10% performance hit, Frezza says. "That's not going to happen for years."

Horwitt is a freelance writer based in Waban, Mass. She can be reached via CompuServe at 75244,1666.

ON NETWORK WORLD FUSION:

- Learn about the Bay Area Research Wireless Access Network (BARWAN) project, aimed at developing a heterogeneous digital communications architecture that accommodates everything from in-room to wide-area wireless nets.
- Access papers from the University of South Carolina Mobile Networking Group, an NSF-funded group that is developing new protocols to support mobile hosts. Papers describe transport- and network-level protocols, as well as new applications specific to mobile computing. (Postscript reader required.)
- NW's recently published Buyer's Guide on wireless data services.

From the main menu, select NetRef, Technology Resources then Wireless/Mobile.

NetworkWorld Fusion

In-box

Continued from page 63

row, turning an intraorganizational workflow system into an interorganizational EDI application overnight.

Perhaps we should scrap the term EDI and refer simply to interorganizational vs. intraorganizational workflow applications.

As Mr. Tucker notes, interorganizational workflow is certainly a technical possibility under the WMC's framework.

However, interorganizational workflow is not likely to meet with corporate lawyers' approval until there is a standard, legally binding format for interchange of process models with associated responsibilities, milestones and performance criteria.

The WMC doesn't appear to have picked up the ball on this.

To be useful, the Workflow Reference Model should capture the main requirements for interoperable, multivendor workflow environments, not some ideal utopian technology.

Clearly, the WMC has neglected some major requirements in its model, including interorganizational process interchange and execution, and Internet, World-Wide Web and X.435 interoperability.

My comments on the WMC's workflow model should be construed as attempts to assist the WMC in tweaking, refining and refocusing a good initial effort.

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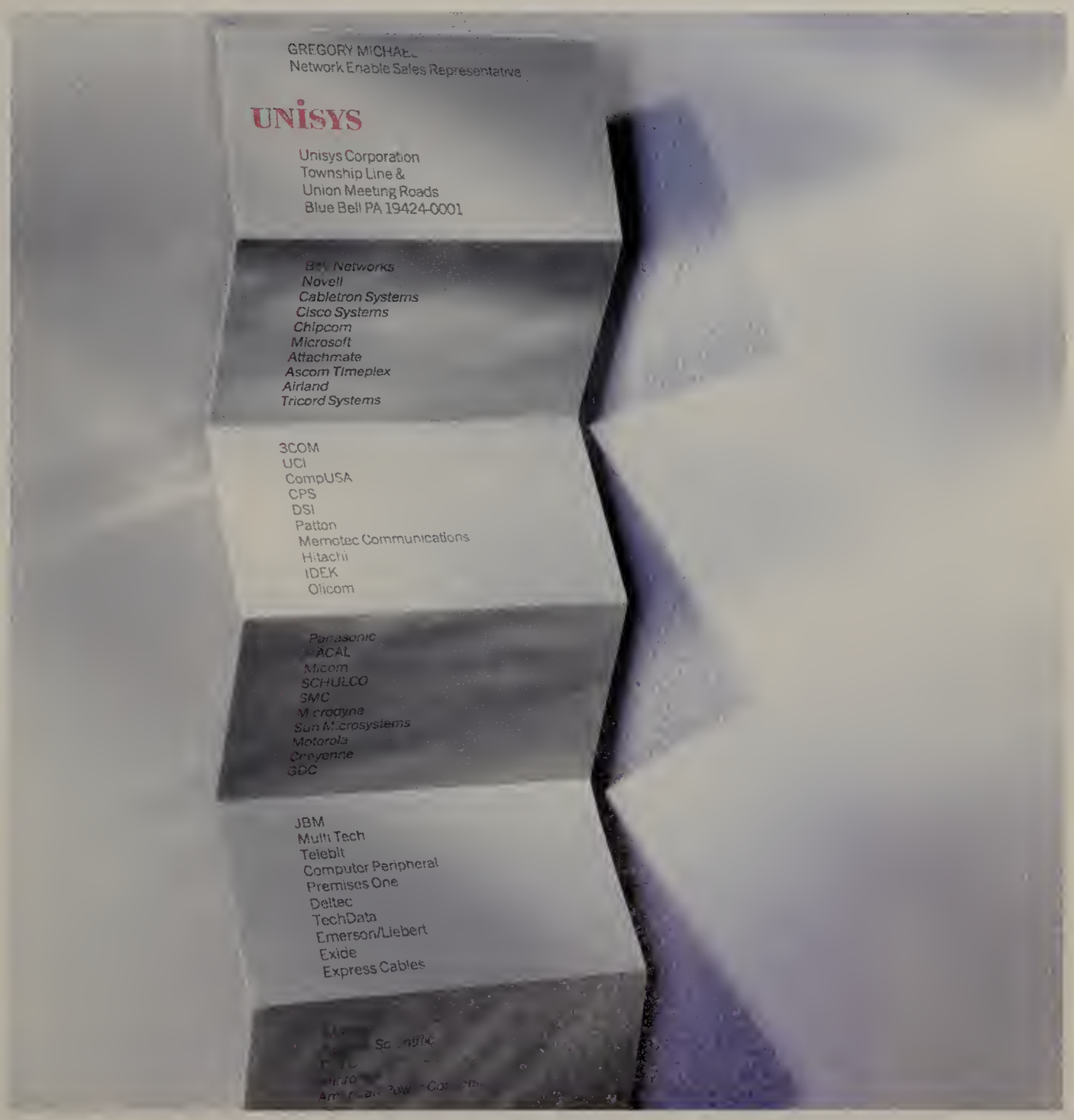

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special section

Wireless Networks

FREEDOM!

We tested four wireless LAN products that let employees cut loose.

By John Ketchersid and Jerry Ferguson

In the ever-changing LAN environment, flexible data communications is a must, but that flexibility must not come at the expense of stability. One type of product designed to fit the bill on both counts is the wireless LAN. While sales of wireless LAN devices are far outstripped by their coppery competitors, our tests of four wireless products show that their anemic market presence is not due to a lack of performance or features.

We looked at wireless LAN access points, which are roughly analogous to hubs or bridges in the wired LAN world. They allow you to integrate different network topologies into one large LAN in a transparent fashion while, at the same time, maintaining reasonable network performance. They provide point-to-point bridging and multinode roaming, the latter of which allows users of portable computers equipped with wireless network adapters to maintain a connection to the network, even while changing access points, much like a cellular phone network.

The good news is that all the products we looked at are both good and comparable enough that we couldn't name a single overall winner. We found the products had all the features typically found in wired bridges. We were impressed with the stability, robustness and all-around performance these systems offered while complying with current standards.

A couple do have drawbacks that will matter to some organizations, however. IBM's 8227 Wireless LAN Entry Access Point lacks the ability to encrypt data, while Xircom, Inc.'s Netwave Access Point lacks Simple Network Management Protocol support. These two are priced lower than Aironet Wireless Communications, Inc.'s ARLAN 630 and Digital Equipment Corp.'s RoamAbout Access Point, however, indicating that at least to some extent, you get what you pay for.

The devices cover surprisingly long distances — 75 to 150 feet in a typical office and up to 650 or 800 feet in a warehouse.

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NetResults

Product	ARLAN 630	RoamAbout Access Point	8227 Wireless LAN Entry Access Point	Netwave Access Point
Vendor	Aironet Wireless Communications, Inc.	Digital Equipment Corp.	IBM	Xircom, Inc.
Phone	(800) 800-8016	(800) 457-8211	(800) 426-3333	(800) 438-4526
Price as tested	$1,995	$1,995	$1,350	$1,499
Pros	▲ Best connectivity – has ports for 10Base2, 10Base5, 10Base-T and RS-232 for management ▲ Multitude of antenna configuration possibilities	▲ Hub-stackable, making it more readily integratable into an existing stacked hub system ▲ Multiple-MIB compliance ▲ Configuration held entirely in flash ROM	▲ Sturdy design ▲ Shielded to reduce interference ▲ Great documentation ▲ Incredible utilities and information for wireless LAN design	▲ Key-based data encryption ▲ Automatic reconnection to NetWare servers
Cons	▼ Standard antenna reduces range ▼ ISA client antenna too easy to rotate, reducing range	▼ No 10Base5 connector	▼ Transceiver required for 10Base2 connection ▼ No ISA client available without additional third-party hardware	▼ SNMP compliance not yet available ▼ No ISA client available without additional third-party hardware

Network World TEST ALLIANCE

HOW WE DID IT

We tested four wireless LAN access points for the following:

■ **802.3 wired Ethernet protocol compliance** — It is imperative that the systems adhere strictly to this standard without the use of any third-party software or hardware.

■ **Range** — The greatest distance achievable between two access points prior to signal loss, and between an access point and a workstation.

■ **Segment-to-segment relocation speed** — Commonly referred to as handoff, including robustness of connection during this transition.

■ **Transfer rates** — In addition to overall throughput between segments via the access points.

We did not test for compliance with 802.11, the wireless Ethernet standard, as it is still under construction.

We performed all our tests twice, once for the average short installation ranging from 60 to 100 feet and once for the average mid- to long-range installation ranging from 150 to 800 feet.

Access point range testing was conducted in two environments. One was a 200,000-square-foot warehouse with no obstructions, representing an open office. The other was a Sheetrock and metal-stud office environment, representing a closed office environment. We performed building-to-building tests over the same ranges with glass windows facing one another.

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Each has a throughput rate of 1M to 2M bit/sec — not that far below the typical realistic throughput of a wired segment.

All of these products support multiple access points in a number of configurations. Each uses an access point ID or an IP address to define itself to the rest of the LAN. That makes routing requests through multiple segments a simple matter of memorizing the route taken by packets from the systems. This is known as spanning tree networking.

For security, Digital supports Data Encryption Standard as an optional add-on, while Aironet uses system ID (SID), a technique in which an ID is assigned to each of the access points participating in a LAN. This ID is one of eight million possible values, giving the system a high degree of privacy and security. Xircom uses a proprietary algorithm to secure data during transfers.

Each of the products has its own special nuances.

Aironet is by far the most flexible access point, with the widest variety of network connections — 10Base-T, 10Base2 and 10Base5. It offers as an option a more powerful antenna, which is a good thing because we found that the standard antenna left something to be desired. In our heat tests, the ARLAN ran cooler, primarily due to an external non-PC Card antenna. By reducing heat, ARLAN decreases failure rates and increases product life. Its proprietary hardware-based encryption is also a nice touch.

Known for its PC Card products, Xircom has a strong presence in the wireless community. Its Netwave Access Point has quite a few features that make it an attractive choice for the office environment. It was the smallest access point tested, with the cable connections held in a recessed pocket. Wall mounting is easy, secure and attractive. Software installation went quite well; once SNMP support is available, configuration will be even more simple.

Multimedia throughput results

Figure 2

	Render time In hours
Aironet	**9.3**
Digital	**9.2**
IBM	**9.1**
Xircom	**9.3**
Stand-alone	**36.0**

Figures represent times required to display 3-D objects using distributed workstations.

Digital's RoamAbout Access Point was extremely easy to install and configure. It is hub-stackable, but the product lacks a 10Base5 connector.

For education and documentation, look no further than IBM. The amount and quality of information included with the 8227 is impressive, and the installation and user guides are comprehensive. A wireless LAN planning guide explains the fundamentals and gives practical information about installing access points.

The attention to detail carries over into the 8227. A solid metal cabinet, sturdy design and clean lines allow this system to be installed so that it takes up the least amount of space possible. Also, this access point is shielded very well. The IBM 8227 was the second coolest running access point, primarily due to an efficient fan system.

Dewiring the lab

Installing wireless remote access points is similar in many ways to setting up a standard wire-bound bridge, and this process is similar in all the products tested. You connect an access point on each LAN segment to a standard BNC Ethernet connector. Then you install the antennas on a wall — either with toggle bolts, chassis mount or Velcro — and connect them to the access point units.

Each unit includes setup software that helps promote a solid signal and cell clarity. We experienced no serious noise problems with any of the units.

Once an access point is online, you can exit the setup software and drop right into the operating mode. Digital's RoamAbout Access Point provided the closest approximation to plug and play, with configuration and systems software held entirely in flash ROM.

Once the access point units "see" one another, the next task is to tell each of them which stations are allowed to pass data through the connection. If the two segments being linked are intended to work as one, there's not much more to do because all

Continued on page 78

Determining access point placement

The first step you should take when considering the purchase of a wireless access point is planning the equipment implementation.

Following are some of the questions you need to ask:

- Where will I place my access point?
- Are there any radio noise generation in the vicinity?
- What are the considerations for antenna mounting?
- Will I need any permits for this type of communications equipment?

You can answer many of these questions by performing a simple survey of the area where you will be installing the wireless access points.

Begin by approximating the distance between two sites. With installations of less than 100 meters, simply pacing off the distance in a straight line is usually accurate enough. Otherwise, try to get a copy of your building's floor plan from the building's management staff or those who installed your LAN cabling. That will also give you a solid understanding of what obstructions you'll have to contend with.

In performing the survey, add 10% to the distance you determine. This offsets any discrepancies in the distance estimate and should not put you in a much higher cost range.

With the exception of building element interference, placement of the access points is usually determined by the point at which the two LAN segments are in nearest proximity to one another.

The physical structure of an office space is also a variable. Solid objects create an obstacle course for your transmission, creating both attenuation, or loss of signal, and duplication.

Attenuation, which is caused by dispersion and absorption of the propagating wave, is a danger. All objects have the innate ability to either reflect, absorb or bend the wave as it travels.

Duplication is simple — just think of miniature golf and how obstructions redirect the ball. Similarly, building walls redirect the signal waves. This effect is noticeable on an automobile radio in the city, when the natural wave hits your antenna quicker than the wave bounced off a nearby building, producing a duplication of sound.

Another attenuation danger is absorption, which produces two effects. First, the signal is lost directly behind the absorbing material. Also, the unabsorbed wave bends at the edges of your wall, creating another point at which the adapter receives two signals when there should only be one. Finally, a wall may bend the wave as it passes through, with the amount of the bend depending on the material.

The omnidirectional antenna typically used for access point bridging does not emit a highly shaped signal, but instead, distributes it in all directions. This type of signal distribution creates a cell similar in shape to that generated by a cellular phone network's signal distribution, allowing a mobile system to move about within this cell without experiencing a disconnection.

Since each access point can only transmit at a given distance, the coverage pattern is a large factor in determining the position and effect of wireless access points. Access points must have some areas of overlap to account for any signal losses. This overlap presents a problem of its own, creating ridges of conflict where the adapter is covered equally by two or more access points.

While some manufacturers would lead you to believe that this only intensifies their coverage, without an efficient and intelligent radio protocol, there is actually a decrease in performance.

As for permits, the Federal Communications Commission prevents wireless data communications vendors from stepping on one another's toes. Therefore, you can purchase, install and use most wireless LAN communications equipment without worrying about permits, licensing or other such regulatory red tape.

Access point features

Figure 1

	ARLAN 630	RoamAbout Access Point	8227 Access Point	Netwave Access Point
Cable connections	10Base2, 10Base5, 10Base-T	10Base2, 10Base-T	10Base-T, 10Base5, transceiver for 10Base2	10Base2, 10Base-T
Frequency band	2.4 GHz	902 MHz	2.4 GHz	2.4 GHz
Data rate	1M - 2M bit/sec	2M bit/sec	1M bit/sec	1M bit/sec
Radio technology	Direct sequence	Direct sequence	Frequency hopping	Frequency hopping
Range (open office)	125 - 200 feet	600 - 800 feet	325 feet	650 feet
Range (closed office)	75 - 125 feet	90 - 110 feet	100 feet	150 feet
Power output	100 mwatt	250 mwatt	50 mwatt	25 mwatt
Rated maximum number of access points	Unlimited	Unlimited	Unlimited	78 hub sequences
Rated maximum number of users per access point	2,048	Depends on throughput	32	30
Local configuration	System console or serial connection	System console or serial connection	None - uses Ripple*	From wired PC on the same network
Remote configuration	SNMP, telnet via TCP/IP	SNMP	SNMP, telnet via TCP/IP	TCP/IP
SNMP compliance	MIB II and ARLAN enterprise	MIB II, IETF Bridge, Ethernet, DEC ELAN, HUB PCOM, AT&T WaveLAN, Proxim RangeLAN	8227 Agent, includes MIB II and definitions of objects for bridges and Ethernet	Under development

* Ripple allows managers to configure systems at a central location and communicate the changes to all systems via the network.

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Ph: 206-861-9535

Continued from page 76

the systems we tested defaulted to this type of connection.

Each product also supports workstation-level access control that lets you identify stations you wish to prevent from accessing the systems on the other side of the link.

This is done via configuration software, either through a telnet, File Transfer Protocol, SNMP management or direct connection (RS-232 or modem).

We chose to limit access to three systems on each of the segments just to see how well the access controls worked. For each of the products, the configuration was simple and worked flawlessly.

Likewise, there was little difference in performance over the entire range of distances tested. Each unit approached its manufacturer's stated flow rates at short, medium and long distances (see Figure 1, page 76).

We used graphical rendering tests to generate high volumes of traffic to test each device's capabilities.

MORE ON-LINE

Learn everything you wanted to know about wireless technology and more. From the main menu, select NetRef, Technology Resources, then Wireless/Mobile.

NetworkWorld Fusion

First, as a baseline, we ran AutoDesk Corp.'s AutoDesk 3D Studio, a program that renders three-dimensional solid objects, as a stand-alone application. The stand-alone rendering test ran for about 36 hours.

Then, using the distributed processing facilities built into 3D Studio, we set aside processor time on each machine attached to the LAN across access points in order to reduce overall elapsed rendering time. With each of the access point setups, the rendering ran a great deal faster (see Figure 2, page 76).

Some variation in render times may reflect task distribution rather than actual LAN performance. When performing this render across the same two segments using a T-1 connection, the ratings were very similar, which indicates that the access points offered performance comparable to that of a dedicated T-1 on this test.

Looking ahead

We were surprised and pleased to find that all the vendors provided knowledgeable, professional technical support.

All in all, we found no gaps in the operation of these wireless devices when compared to their wired counterparts. This begs the question, why isn't wireless taking off?

The higher price of wireless options is, of course, one consideration. Another may be a lack of trust in invisible connections vs. the reassuring solidity of a tangible wired connection.

Wireless networking vendors must address not only the price issue, but also the comfort factor through education of the networking market before this technology becomes as prevalent in the data arena as cellular telephones are for voice.■

Network World TEST ALLIANCE

The alliance is a cooperative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 63.

Ketchersid is president of Latsu, Inc., a hard-media magnetic storage systems research and development firm in Atlanta. He can be reached at hardware@netcom.com. Ferguson is a multimedia design engineer specializing in technical communications. He can be reached at gt7162b@acme.gatech.edu.

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Customer is responsible for determining the compatibility with their systems. Optional equipment required. Novell® and NetWare® are registered trademarks of Novell, Inc. TRIL qualified Token Ring Products are certified for physical interoperability in multivendor environments.

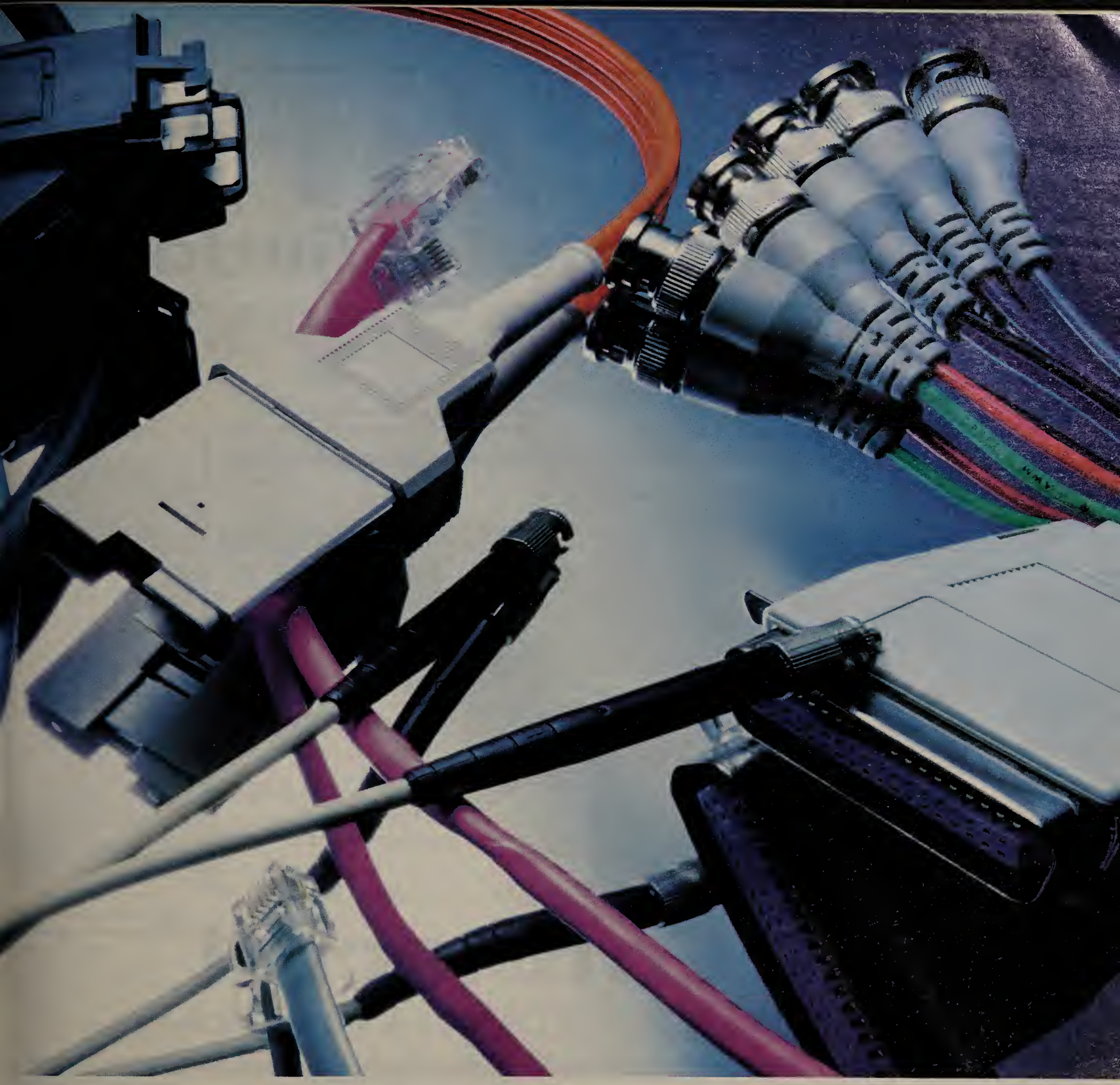
Can your network do this?

"Connect everything to everything." You probably have one of the simplest job descriptions in your company. And at the same time, you also have one of the most impossible jobs to do.

The fact is, with the complex maze of components and systems you have to deal with, it takes much more than the latest and hottest technology to unify a network. It takes vision. And that's something you're not very likely to get from a narrowly focused manufacturer.

The good news is, IBM has been dealing with the ins and outs of interconnectivity since the first networks were born. So we can help you connect existing platforms and operating systems with just about any kind of hardware and software solution out there. We can also make sure you're ready to exploit new standards like ATM, which represents the high-bandwidth future of networking.

We not only understand the trend to switch-based networks—we're leading the industry by integrating high-speed switching



technology into our full line of network products. This Switched Virtual Networking strategy is part of our Nways™ family of switching products, as well as our workgroup hubs, concentrators and wireless LAN technology. It's also part of our line of adapter cards that can integrate computers of any breed into your network.

No question, the days of single vendor solutions are long gone. But it can certainly be helpful to have one partner who brings a depth of experience and a wide range of product offerings, to make sure that your diverse network continues to perform at the highest level.

So give us a call today at 1 800 IBM-3333*, ext. DA 108. We'll show you how we've helped companies all over the world gain a true competitive advantage by building a smarter, more efficient network. Or visit our web site at http://www.raleigh.ibm.com/netad.html to find out more. After all, you have a world of technology to deal with. And we can help you bring it all together.

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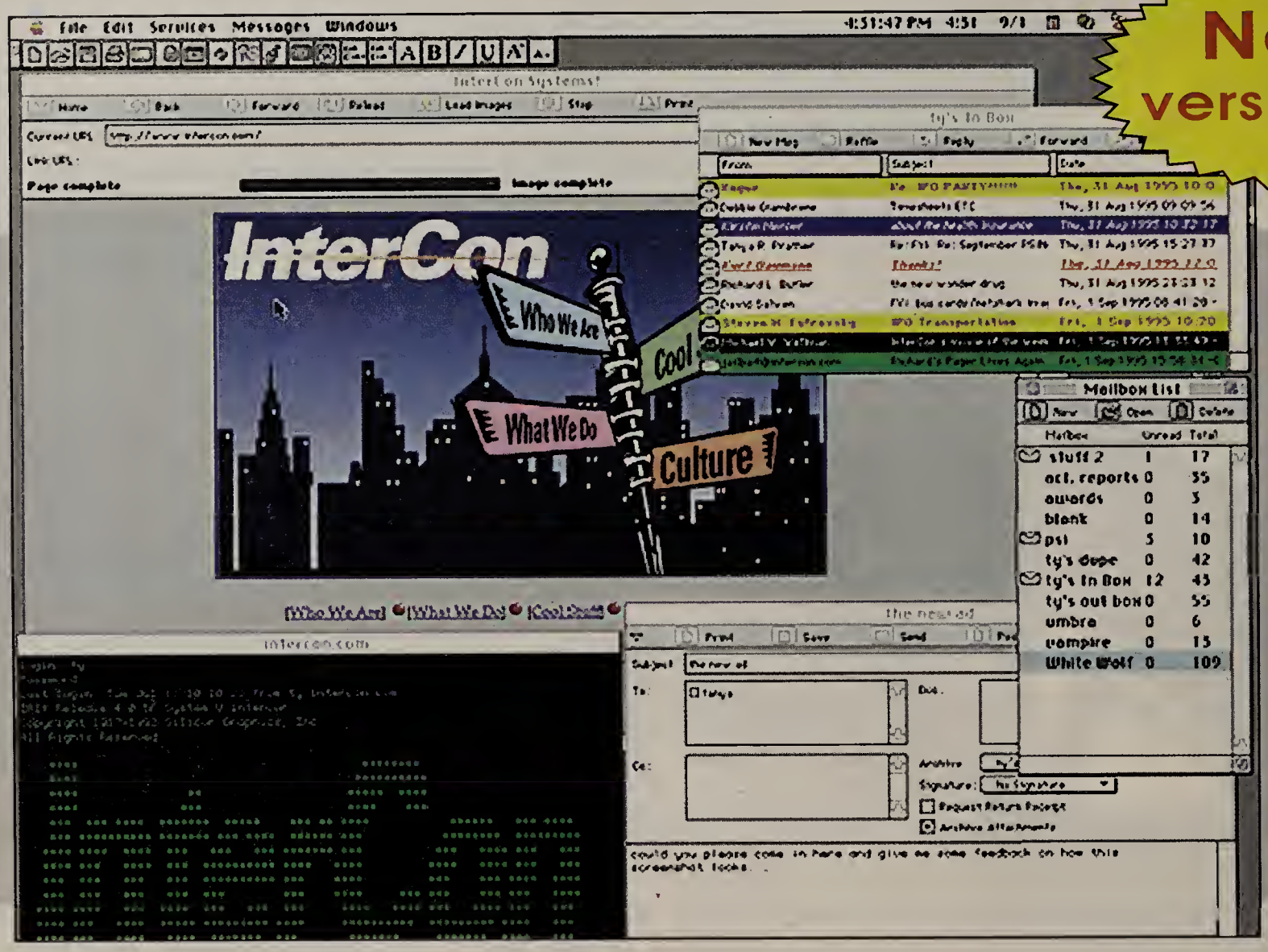

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Briefs

■ **Rapport Communication** *has published a report that evaluates Lotus Development Corp., Microsoft Corp. and Novell, Inc.* **messaging products.**

The 100-page report measures strengths and weaknesses for Lotus' cc:Mail and Notes, Microsoft's Windows 95, Exchange Client and Mail 3.X, and Novell's GroupWise XTD and Message Handling Service (MHS). It also evaluates the products' security, directory services and Internet links.

Priced at $395, the report includes detailed matrices for analyzing product functionality and instructions for calculating the cost of a client/server-based messaging system.

There is also a purchasing decision methodology that will aid users in making their final product selection.

Rapport Communication: (770) 645-1250.

■ *A* **Media Conferencing Users Group** *was formed last month at the TeleCon XV trade show in Anaheim, Calif., to provide a forum for users to share experiences with* **data conferencing and videoconferencing** *technologies.*

Formed with the aid of Pacific Bell and Applied Business TeleCommunications, the group is expected to meet at least twice a year, once in Northern California and once in Southern California.

For more information on joining the group, call Will Schultz of Pacific Bell at (415) 545-1622.

■ **Decision Servcom, Inc.** *has completed its acquisition of* **Bell Atlantic Business Systems Services.**

The new company — called DecisionOne — will offer services such as vendor and warranty management, help desk management, network administration and network services.

Decision Servcom: (215) 956-6700.

Analysis tool provides network ROI reports

First version of C/S Solution Advisor supports Novell NetWare; Microsoft Windows NT Server version is on tap.

By Jim Brown

Interpose, Inc. last week released a financial analysis tool that will help you generate cost-of-ownership and return-on-investment reports for Novell, Inc. NetWare- and, eventually, Microsoft Corp. Windows NT Server-based nets.

Interpose's C/S Solution Advisor package will arm you with the detailed reports needed to plan cost-effective network or server capacity upgrades, determine the ongoing cost of supporting various client/server applications, and cost-justify investments in new storage devices and other network components.

Key to the product is a set of cost analysis metrics developed by leading consulting firms such as Forrester Research, Inc. of Cambridge, Mass.; Gartner Group, Inc. of Stamford, Conn.; Infonetics Research, Inc. of San Jose, Calif.; International Data Corp. of Framingham, Mass.; and Strategic Research, Inc. of Santa Barbara, Calif.

The metrics require you to plug in information specific to your environment and will tap network configuration data collected by C/S Solution Advisor to prepare needed reports. For instance, you can enter data about how often a network was down and the duration of each incident.

This data and the stored network configuration information is then employed to calculate the lost productivity each outage caused.

C/S Solution Advisor can also be employed to find out whether the cost of installing new equipment to prevent downtime is justified.

The product uses Interpose proprietary technology to gather network configuration data maintained on NetWare servers. According to Interpose, it plans to ship early next year a version of C/S Solution Advisor that will gather data from Windows NT Server-based networks.

It's in the objects

The package was developed using object-oriented technology, which made it possible for Interpose to implement financial metrics as a set of common rules that can be applied against different pieces of data input by users. Interpose is encouraging consulting organizations to develop new object-based metrics that can be plugged into C/S Solution Advisor as add-on modules.

C/S Solution Advisor costs $495 and runs on Windows 3.X- or Windows 95-based PCs with 8M bytes of RAM.

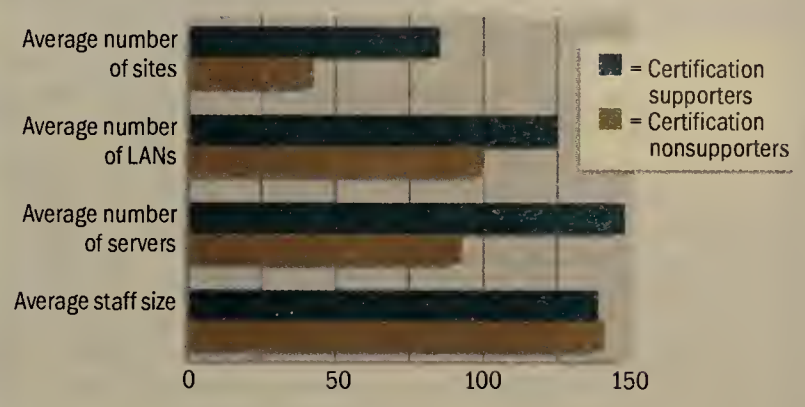
✆Interpose: (407) 260-5551.

STUDY POINTS OUT CERTIFICATION BENEFITS

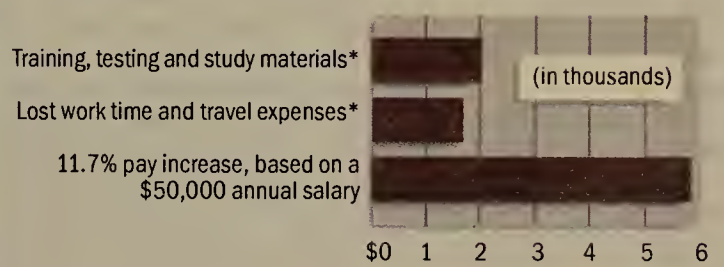
Companies that pay to certify workers to use key products have more productive employees who can operate more sophisticated client/server environments than companies that do not, according to an International Data Corp. study.

The study was based on telephone interviews last June with 253 managers and was sponsored by certification testing company Drake Prometric as well as IBM, Lotus, Microsoft and Sybase. It found:

Companies that pay to certify employees support more sites, LANs and servers with the same size staff as those that do not:



The cost of certification includes:



* Half the respondents paid more and half paid less.

Companies investing in certification expect and believe they receive all or some of these benefits:

- Increased productivity from greater product knowledge.
- Assured levels of expertise and skill.
- Improved support.
- Reduced ongoing training costs.
- Higher morale and commitment.

Take your choice of database conferences

If you're looking to attend a conference that will shed light on database and client/server application technology trends, you've got a critical decision to make. Both the DB/EXPO '95 and the Database & Client/Server World shows are being held early next month.

■ **DB/EXPO '95** — This show will run Dec. 4-8 in New York and include three conferences.

The Database and Client/Server Development conference will cover a mix of client/server application development issues, including object-oriented technology, enterprise computing, and middleware and distributed computing. The Data Warehousing and Parallel Computing conference will explore data warehouse development issues, parallel computing technology, and data access and on-line analytical processing tools. The DB/EXPO Executive conference will look at a mix of business topics, including how to control the hidden cost of client/server computing, how to figure a return on investment for data warehouse products and examinations of Microsoft Corp., IBM and Lotus Development Corp. product strategies.

DB/EXPO '95: (415) 966-8440.

CONFERENCE *planning*

■ **The Database & Client/Server World conference** — Sponsored by Digital Consulting, Inc. (DCI), the show will run Dec. 5-7 in Chicago.

It will include 10 conference topics, including systems management in a client/server environment, data and object modeling, multitier and extended relational DBMS architectures, and groupware application development. META Group, Inc. will sponsor a Client/Server Application Packages Conference that runs concurrent with the show from Dec. 5-7.

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More detailed information about the company and each position may be viewed on-line: Internet: via telnet career.com or IP Add: 198.207.167.1, via WWW http://www.career.com, or modem (415) 903-5815 (Settings: 8,N,; Emulation: ANSI or VT100).

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NY, VA, MI, IN, NC, GA AND THROUGHOUT THE U.S.

Deliver on-site post sale service concerning our equipment and software. Install, configure and maintain products at the customer site. Requires data communications design and troubleshooting experience; excellent knowledge of network diagnostic tools; and expertise in networking standards and protocols. **Code KM/RE**

PROTOCOL DEVELOPERS - BILLERICA, MA

OSPF – Working on OSPF implementation, you'll add new features within the OSPF protocol to our current implementation. Knowledge of TCP/IP is important, but not required. Experience with OSPF and embedded systems a major plus. **JS/OSPF**

QOS – With a focus on IP multicasting/QOS, the initial project involves developing features for RIP, and transitioning over QOS work. Knowledge of TCP/IP is a must, along with systems experience. Experience with traffic shaping and multicasting a plus. **JS/QOS**

ISP – Develop new features, fix bugs found by the ISPs, and potentially work with ISPs to define new protocols that solve problems not addressed by current protocols. Must be highly knowledgeable about TCP/IP and the related routing protocols. Experience with BGP a major plus. Embedded development experience is also required **JS/ISP**

CS NEW PRODUCT INTRODUCTION ENGINEER - BILLERICA, MA

Provide technical expertise with a focus on supportability to the new product development cycle. Specify product serviceability requirements, technical support strategies, and processes for new and existing product lines. Requires BSEE/CS or MSEE/CS, a minimum of 7 years' experience in data communications, and exposure to software development. Technical experience in product development with a customer support function preferred. **Dept. GR/NPI**

AGENT APPLICATIONS SOFTWARE ENGINEERS - SANTA CLARA, CA

Design and develop network management agent applications software for hubs, residing in an embedded system environment with multi-tasking kernel, network management engine, and 68K or 80X86 equivalent microprocessors. Requires a BSEE/CS, MS preferred, 3+ years' software development experience. Background in RMON or related SNMP agent applications is preferred UNIX/C skills a must. Knowledge of internetworking issues with bridges and routers is a plus. **Code JD/ASE**

LAN FIRMWARE MANAGER - SANTA CLARA

Manage development of firmware for LAN hubs, residing in an embedded system environment with multi-tasking kernel and 68K or 80X86 microprocessors Integrate existing firmware modules working with hardware engineers to debug firmware. BSCE/EE or equivalent and 3+ years' related management experience required Experience with real time operating system(s) and in writing device drivers. Requires recent work on embedded systems working with ICE, cross compilers, debugging, and a working knowledge of BOOTP, TFTP, SNMP protocol and LAN technologies **Code JD/LFM**

SOFTWARE AGENT INFRASTRUCTURE ENGINEER - SANTA CLARA, MA

Rearganize and rewrite code into reusable modules. Assess existing products, define code relationships, coordinate re-engineering or reverse engineering efforts. Requires a BSCS or equivalent, MS preferred and a minimum of 3 years' experience working with reusable software, reverse/re-engineering, code library development, and source code control systems such as PVCS, RCS or SCCS Background with source browsers, Imake, make, shell scripts, MRI and/or Gnu compilers. **Code JD/SAI**

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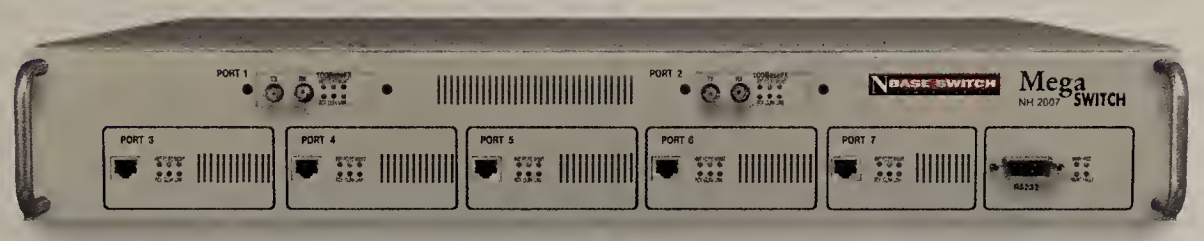

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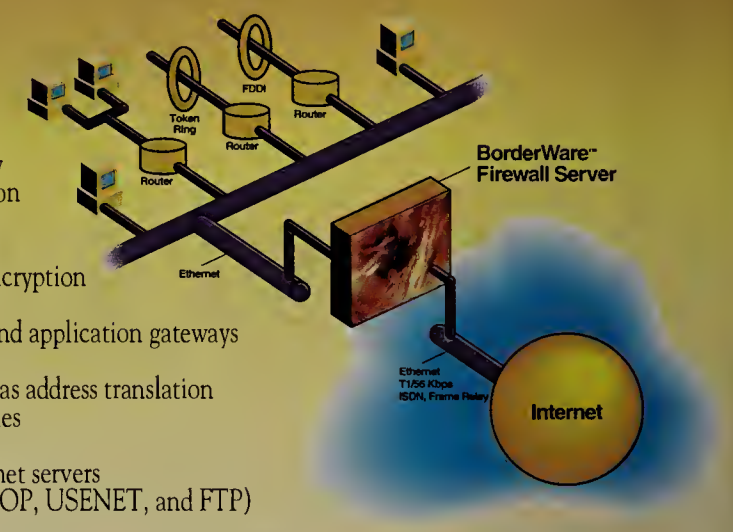

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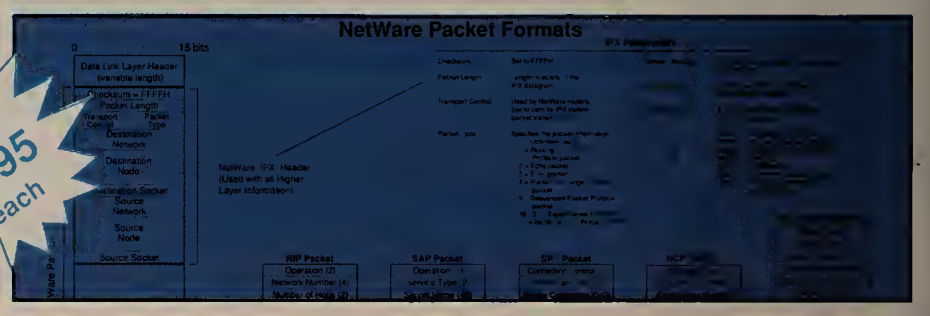

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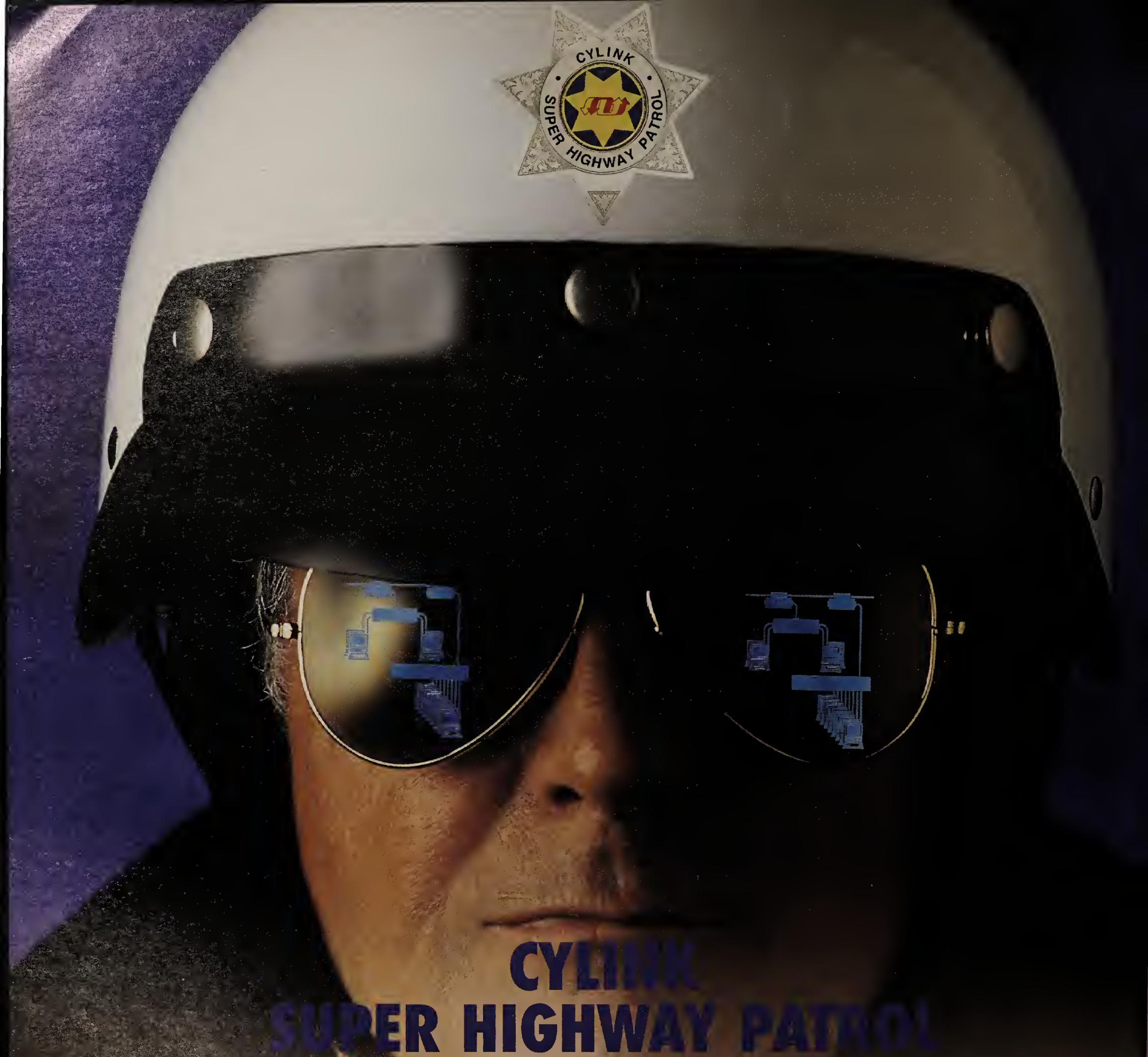

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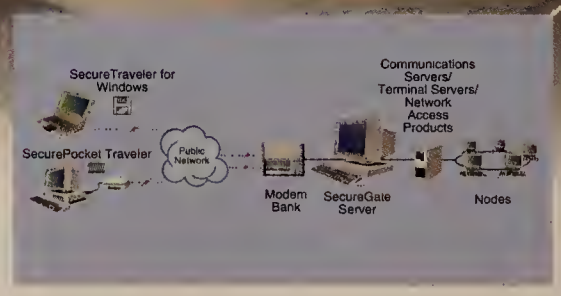

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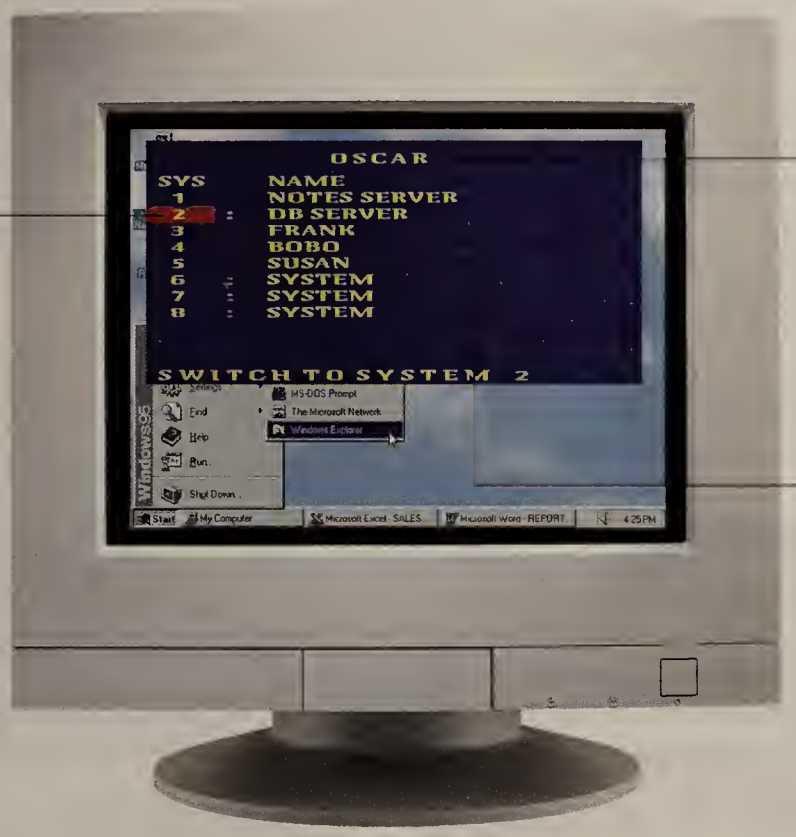

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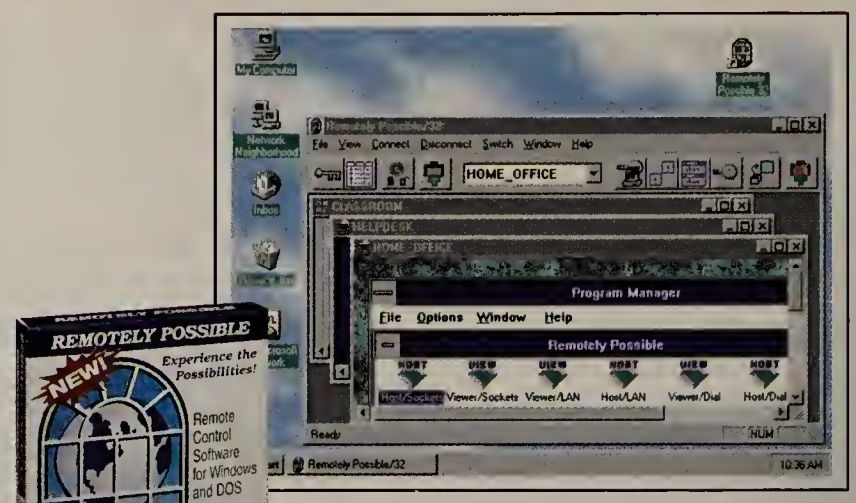

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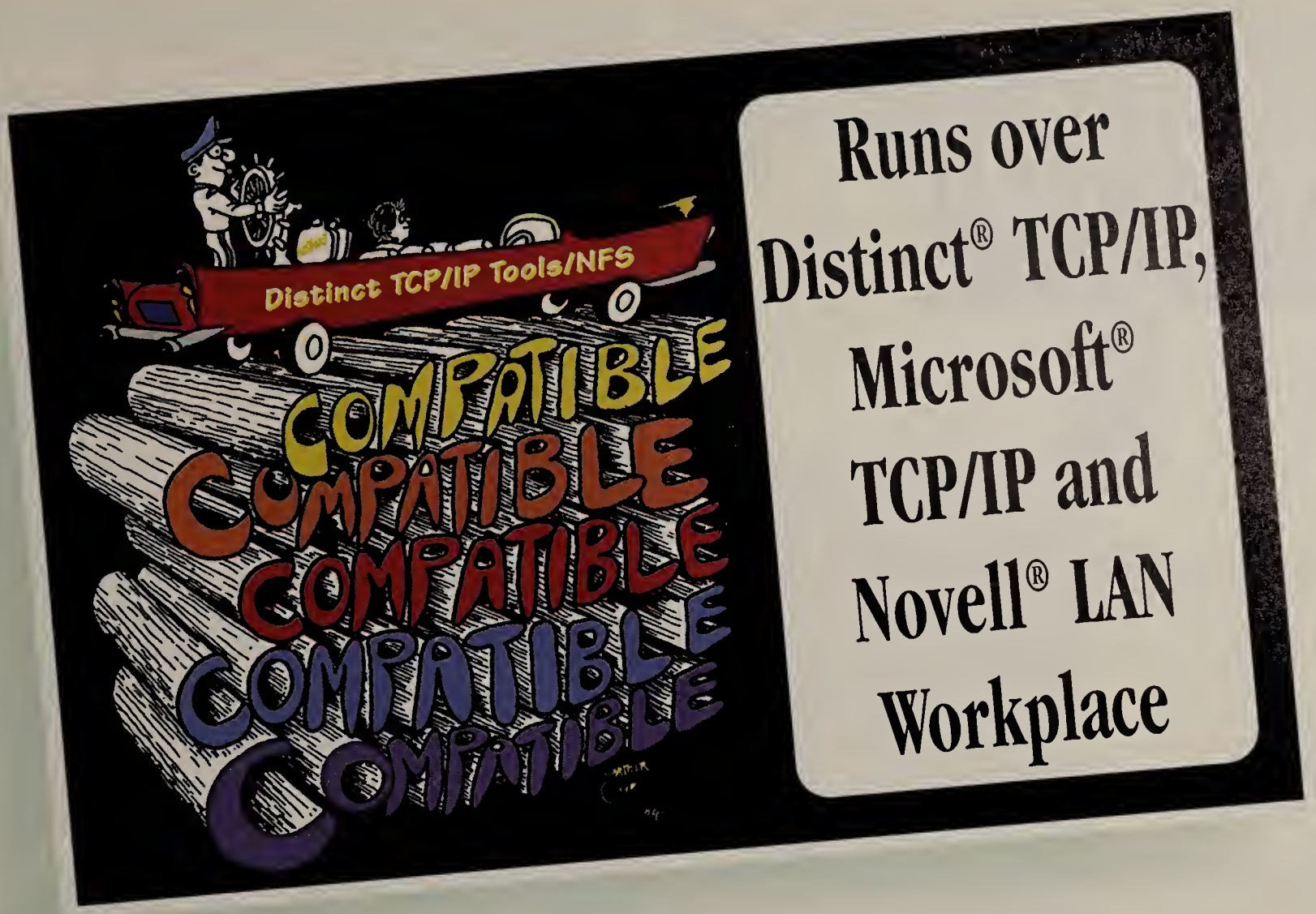

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New Frontier Technologies Software Brings NetWare Users to the Internet

By ANN KRAUSS

Frontier Technologies Corporation has announced the first NT-server based product that offers Internet access, TCP/IP and host connectivity for Novell NetWare environments. Called CyberJunction™, the product combines an innovative transmission gateway with a robust suite of Internet and host connectivity applications. This enables NetWare clients to connect to the Internet and other hosts with speed and security without running TCP/IP on every desktop.

CyberJunction is bundled with Frontier's robust web server, SuperWeb™ Server, allowing NetWare users to improve internal and external communications through the World Wide Web. The client product includes Frontier's award-winning Internet applications from SuperTCP Suite 1.2 and SuperHighway Access 2.

CyberJunction provides IPX to IP bridging through a Windows NT-based server, eliminating the need for TCP/IP software on every desktop. This protects the users' investment in NetWare and avoids the extra administration required to manage dual IPX and TCP/IP protocol stacks on each client PC. Transmission speed for customers is dramatically improved. By utilizing an NT-based solution rather than a NetWare NLM solution, performance of the NetWare network is not impacted. Neither the NetWare server nor client have individual IP addresses, protecting the LAN from intrusion from the Internet. This product also prepares companies for a gradual migration to an open-system TCP/IP environment.

"CyberJunction demonstrates Frontier Technologies' continuing commitment to develop market-driven product solutions," said John Teitgen, president of Frontier Technologies. "There is a huge installed base of NetWare networks with users that want to experience the benefits of the Internet. CyberJunction is an extremely easy-to-install, powerful and cost-effective solution that allows NetWare users access to the Internet and to the corporate TCP/IP network. In addition, the SuperWeb Server brings the power of web technology to the NetWare environment, allowing companies to improve their communications both internally and with the outside world."

CyberJunction Components

CyberJunction is a powerful NT-based IPX to IP gateway. The product is designed specifically for work groups, and includes a complete set of Frontier's award-winning TCP/IP and Internet applications, including a multi-protocol, commercial-grade browser, Internet organizer, MIME Email, telnet terminal emulation, FTP client/server, TN 3270, VT320, VT100 and remote utilities.

"CyberJunction fills a strategic gap in the market by providing Novell users with greatly improved connectivity and security, while at the same time giving their customers access to information via the World Wide Web," said Frontier Technologies senior product manager Joe Haley. "We provide a migration path to NT-based applications while protecting the embedded NetWare infrastructure."

Frontier's SuperWeb Server is a complete "enterprise information system." By combining client and server components, the SuperWeb Server dramatically improves the level of communications between workgroups, customers, suppliers and vendors. "In a competitive world, information is a weapon that separates winners from losers," said Haley. "SuperWeb Server gives its users a competitive edge."

Pricing and Availability

CyberJunction is available through Frontier Technologies' direct and reseller channels. CyberJunction is sold in 5, 10, 20, 50 and 100-user packages; pricing starts at $1795 for a 5-seat license. The SuperWeb Server is included with 50 and 100-user packages, and is otherwise available as an add-on for $795 with 5, 10 and 20-user packages.

Frontier Technologies Corporation is a supplier of Internet, networking and TCP/IP applications for personal computers. Frontier's networking software enables individuals to be more productive and business to be more competitive on a global basis. Headquartered in Mequon, WI, Frontier has offices in California, Pennsylvania, Europe and India, and employs more than 140 people worldwide.

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100 Base-TX Fast Ethernet Hubs

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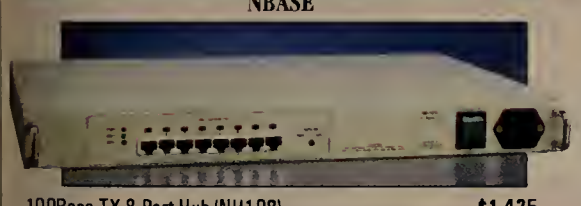

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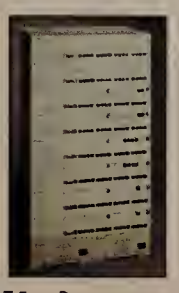

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Ethernet Switch,16 RJ45,
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(PSP16-M041) $7,095
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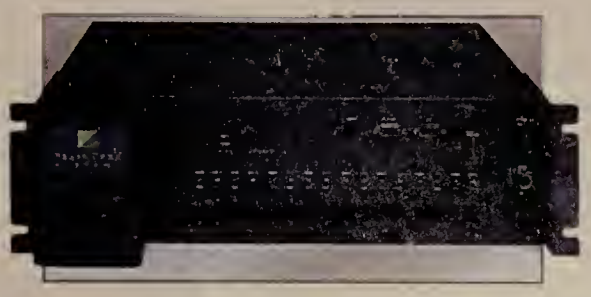

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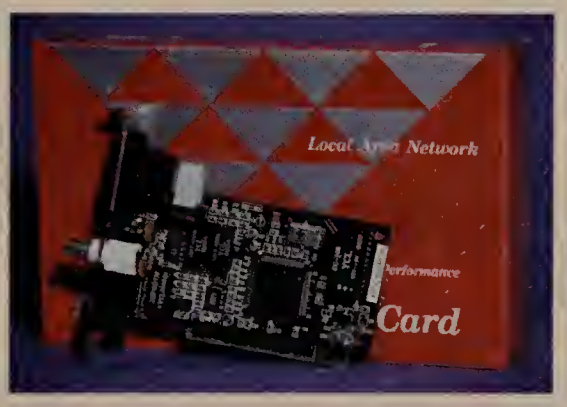
ISA BNC (ENET16C) $37
ISA RJ45 (ENET16T) $37



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RJ45/BNC/AUI (HT2100PCI+PCI) $99
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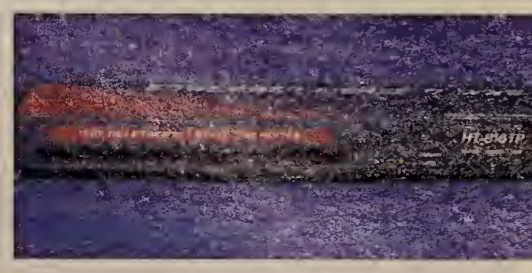

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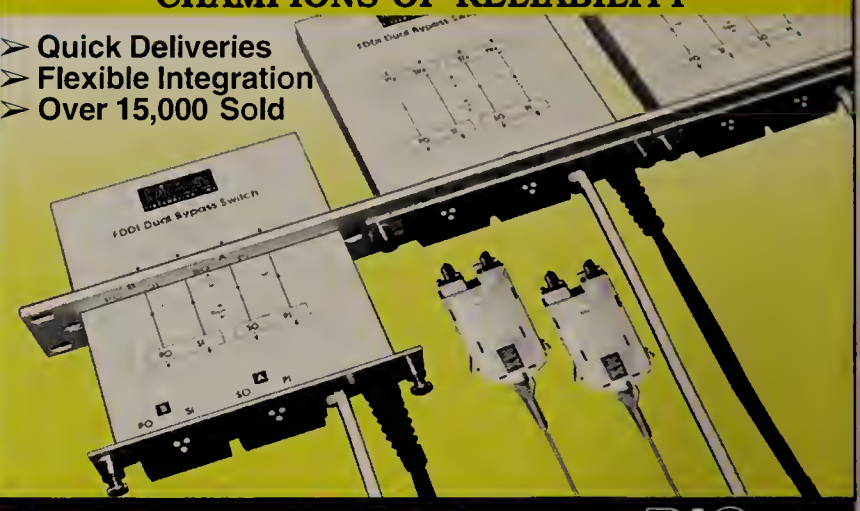

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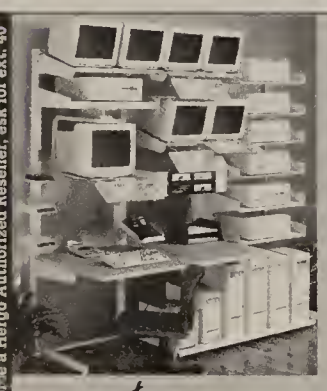

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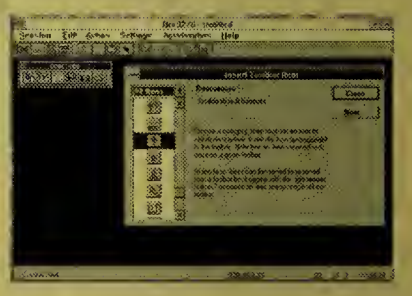

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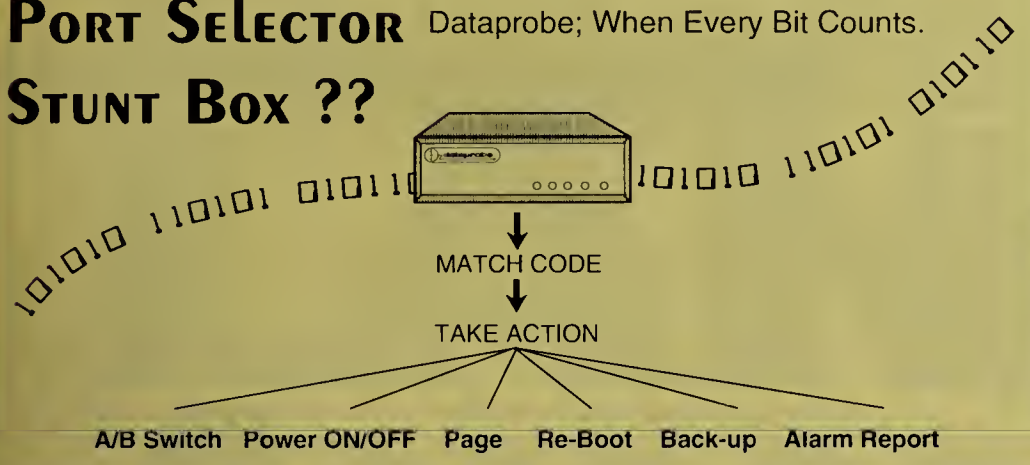

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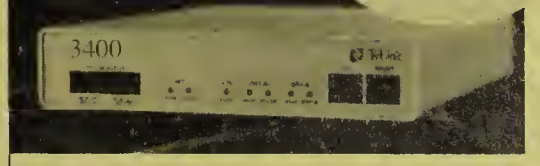

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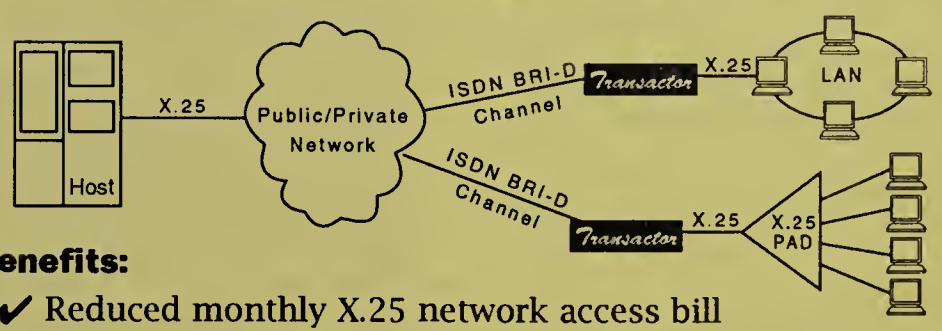

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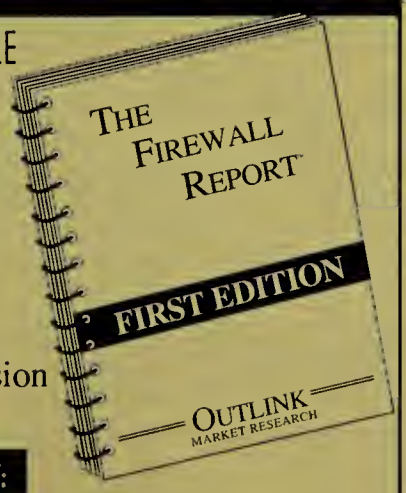

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Windows NT

Continued from page 1

its belt, NT is becoming a bit of a fireball.

Fueling its most recent momentum are a series of big customer and developer wins. A number of NetWare 3.X users are upgrading not to 4.1, but to NT, and software developers are following them on this path.

In other cases, NetWare shops are sticking with the Novell, Inc. network operating system (NOS) but are adopting NT as a strategic application server — a move that could eventually pave the way for NT as the NOS (see story, this page).

The once-maligned operating system is rising fast. Framingham, Mass.-based International Data Corp. estimates that NT sales made up 13.3% of total server sales during the first half of 1995, compared to less than 5% in 1994.

Besides Microsoft's traditional stubbornness, several other factors contributed to NT's growth, including:

- An architecture newer than most of its competitors.
- Shares the same API with Windows clients and has good client integration.
- Lowball pricing.
- Multiplatform support.
- The client can run the bulk of Windows 95 applications.
- Native TCP/IP support.
- Easy configurability.
- Partnering with enterprise-savvy OEM vendors, including Hewlett-Packard Co. and Digital Equipment Corp.
- Integration tools for NetWare and other operating systems.

Microsoft has wooed independent software vendors successfully enough that it now claims some 900 third-party applications for Windows NT.

Some of the company's biggest wins came by appealing to vertical markets.

Microsoft executives often speak at industry-specific events, and its corporate consulting organization has hired staff that is familiar with targeted industries, said Robert McDowell, vice president of Microsoft's enterprise customer unit.

"I want to speak their language so you get a sense that we do care and understand how to position our products to solve real problems in that industry," McDowell said.

"I want to speak their language so you get a sense that we do care and understand how to position our products to solve real problems in that industry."
Robert McDowell

Solid partners

Partnering with hardware vendors that are already familiar with the enterprise market has opened a few doors for Microsoft.

The firm paired with HP for a recent big win with aluminum manufacturer Alcoa Corp. of Pittsburgh, which plans to deploy 10,000 Windows NT Workstation clients and 450 Windows NT servers running several BackOffice applications.

In August, Microsoft agreed to invest more than $50 million in Digital's Multivendor Customer Services and Systems Integration groups, primarily to hire and train a total of 1,500 Microsoft-certified support professionals who will share sales calls.

NT's biggest target, besides the many flavors of Unix, is Novell's NetWare. Shrewd Microsoft capitalized on user confusion and concern over Novell's direction after it replaced Ray Noorda with a new chief executive officer, who made a series of strategy changes over the past year.

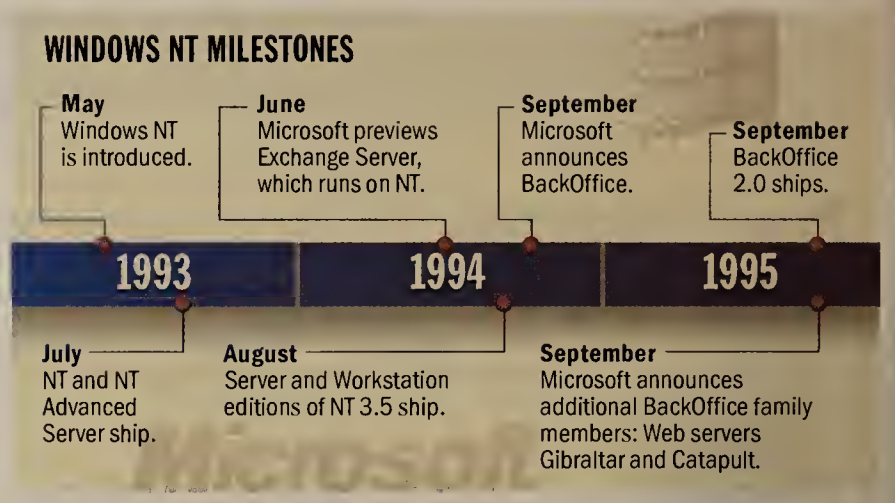
"Novell was hit badly for not knowing how to respond to a competitor," said Robert Ginsberg, a senior field engineer with The Computer Group, which handles outsourced IS functions for large corporations and is a Microsoft Solution Provider and a NetWare value-added reseller.

Ginsberg credits Microsoft with making "a lot of good, basic steps" into the enterprise, such as implementing TCP/IP clients in Windows NT and Windows 95. This way, they were immediately ready for the Internet access that many corporations seek.

Novell's biggest differentiator from NT — its directory — has not been tested in large enough installations to make it credible at that level, said Frank Caratozzolo, senior information specialist at a large East Coast pharmaceutical manufacturer.

"The biggest [NetWare Directory Services] installation I know of is about 30,000 seats," Caratozzolo said. "We have about 50,000 accounts. Do we want to do alpha testing for Novell?" ■

WINDOWS NT MILESTONES



Net managers testify on NT's behalf

Perhaps the biggest reason for NT's momemtum is that the operating system is a core piece of the Microsoft Corp. puzzle, IS professionals said.

It not only anchors the database, systems management and messaging systems, but also ties all these in with Microsoft's client operating systems and applications.

All these factors make it just too easy to put in Windows NT servers, adopters said.

Network manager Niraj Patel wants to stick with Novell, Inc.'s NetWare 4.X as the core network operating system at GMAC Mortgage Co. in Elkins Park, Pa., but 10 of the 19 servers he installed this year run Windows NT. He previously had no NT, meaning that Microsoft's network operating system (NOS) market share at GMAC Mortgage jumped from zero to more than 50% in one year.

"I'm not going to replace any NetWare servers with NT servers, but NT is coming into our environment as an apps server," confirmed Patel.

Windows NT is a better application server than NetWare, according to Patel. It's easy to install, it works more easily in a TCP/IP network than NetWare, and Microsoft has bent over backward to give support.

In other organizations, NT is coming in as an application server and staying as the NOS. That is what is happening at Chevron, Inc. The whole company is migrating from NetWare to Windows NT because it is standardizing on Microsoft's Mail and the upcoming Exchange, which run on NT servers.

It makes no sense to support a second NOS if you get one in your apps server, said Jim Lisiak, senior software engineer at Chevron subsidiary Chevron Information Technology Co. in San Ramon, Calif.

That artful integration of Microsoft applications helps one product usher another into the enterprise, several net managers noted. "Exchange is why we're going to Windows NT," said Tom Webb, manager of electronic messaging at Shell Services Co., the information technology arm of Shell Oil Co. in Houston.

The company expects that its 16,000 users, running a variety of desktop client operating systems, will all eventually connect to Windows NT servers, which may eventually displace the OS/2 LAN Server that dominates Shell's local nets.

By Kevin Fogarty and Peggy Watt

Microsoft seeds marketplace with Internet development tools

By Peggy Watt
Redmond, Wash.

Microsoft Corp. is applying its trademark market-building methods to the Internet, announcing this week several development tool kits intended to seed its Internet technology.

'Net development duo

Microsoft Internet Software Development Kit

- Designed for ISVs.
- Includes Blackbird content preparation tools, Gibraltar server software and Internet Explorer browser.
- Supports Internet Server API and OLE.

Internet Business Development Kit

- Designed for Solution Providers and VARs.
- Includes Gibraltar, Internet Assistant and Internet Explorer 2.0 browser.
- Microsoft will conduct demos and release whitepapers in support of third-party developers.

Both its Solution Providers partners — which are typically value-added resellers and systems integrators — and current Microsoft independent software vendors (ISV) will get free bundles of Internet tools and information next month. Microsoft will push hard into the Internet market through both those segments, which have helped the company capture new markets in the past.

The company next year will also offer an Internet Specialist certification to the 10,000 worldwide participants of the Solution Providers Program.

"The Internet is [Solution Providers'] next great opportunity," said Paul Bazley, director of Microsoft's Solution Providers Program. Microsoft's research found that 70% of its Solution Providers offer Internet-related services now or expect to within six months, he said. The company wants its Solution Providers to consider Windows NT an optimum platform.

The Internet Software Development Kit (SDK) is aimed at Microsoft's traditional software developer customers and will be initially distributed through its Microsoft Developer Network subscription service to 150,000 Microsoft ISVs.

The tools work with other Microsoft programming tools. In fact, the Internet SDK contains portions of the Windows 95 and Windows NT SDK to help developers more tightly integrate their Internet applications and the client operating system, said Doug Henrich, director of developer relations in Microsoft's developer division.

"We're providing tools to help them make Internet connections transparent," Henrich said. He encourages ISVs to "treat the Internet as a broader LAN that lets users interact across miles, not just cubicles."

The ISV tools will support companies ranging from desktop tool makers to Web server developers and other commercial tool vendors, according to Henrich.

The SDK will include most current Microsoft Internet-related tools, plus source code and sample applications.

On-line support will be available in closed sections of Microsoft's Web site, he added. ■

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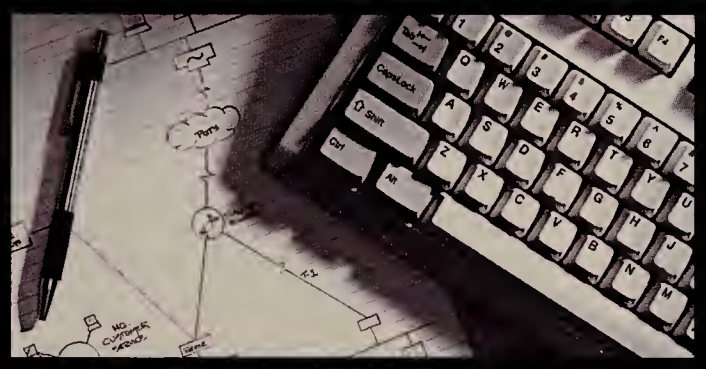

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TCP/IP

Continued from page 1

a day late and a dollar short only to find Hewlett-Packard and other superserver companies have taken over the account. TCP/IP is not something [those vendors] have to adapt to."

"Ease of use and open connectivity haven't been hallmarks of the mainframe, but we're working to change that," Michael Coleman, general manager of IBM's PC server group, told the Guide International IBM user group. "The majority of the world's resources are on mainframes, and we want to open it up and make it more usable."

This effort will translate into new features for its primary open software platforms for MVS — TCP/IP for MVS and OpenEdition/MVS.

The current version of TCP/IP for MVS will be rewritten to provide faster response times and easier access to mainframe resources from the TCP/IP environment, according to Jeff Reser, a member of the technical marketing staff at IBM.

"The current version of TCP/IP for MVS has at its core the TCP/IP stack from VM, so it has a lot of excess scaffolding that will be removed so it can run faster and more efficiently," Reser said.

IBM also will add support for Open Shortest Path First routing and support for devices running tn3270E emulation. Allowing 3270 devices to access SNA hosts over TCP/IP nets, tn3270E is a new version of the tn3270 standard that adds support for items such as host printing.

The new software will also support a high-performance TCP/IP sockets interface that will improve the throughput of TCP/IP applications on the mainframe, Reser said. Additional improvements will give users a native TCP/IP interface to CICS applications and improved DB2 access.

Further out is TCP/IP support for the S/390 Parallel Sysplex environment, which straps together multiple mainframes in a cluster. IBM's microprocessor-based parallel-processing mainframes are IBM's strategic future superservers for large networks.

For this environment, IBM will add the ability to distribute TCP/IP's Domain Name Service (DNS) so the Sysplexed mainframes can distribute the TCP/IP workload. DNS identifies and controls access to resources in a TCP/IP environment.

Additional support for the transportation of TCP/IP data over Asynchronous Transfer Mode-based services will also be added in the future, Reser said.

The new TCP/IP for MVS version will work hand-in-hand with TCP/IP improvements IBM has slated for other mainframe communications products. For example, it is working to let VTAM handle TCP/IP flows to the mainframe (*NW*, Aug. 21, page 1). IBM said users could see at least a sixfold improvement in throughput with VTAM handling TCP/IP activity.

Other work is also ongoing to improve TCP/IP throughput via the 3745/3746-900 front-end processor family.

Open says TCP/IP

TCP/IP support is also being improved in OE, IBM's other key mainframe system. OE is Distributed Computing Environment-based software that lets users run native Unix applications on the mainframe. It is the driving product behind IBM's desire to ensure a role for the mainframe in Unix-based client/server nets.

For OE, IBM is adding a new package called the TCP/IP Version 3 OpenEdition Applications Feature, which includes new network utilities and applications. For example, OE will now support a telnet server, which lets users on other TCP/IP hosts log on directly to an OE host and gain access to the OpenEdition shell and applications. Previously, TCP/IP users had to go through the mainframe Time Sharing Option application, which would slow down transactions and complicate communications.

OE will also get a File Transfer Protocol server, which will let mainframes exchange files with other TCP/IP hosts. The new package will also support the Open Software Foundation, Inc.'s Motif interface and X Window System-based devices.

Guide users generally applauded IBM's direction, but added that IBM needs to continue to integrate new features and simplify the process of setting up enterprise nets.

"These networks are becoming increasingly complex, and everyone is faced with having to do more with less, so the more things IBM can fit together and simplify, the better it will be for the user community," said John Norris, who runs a large SNA and TCP/IP shop and is networking topic advocate for Guide. "We run a lot of TCP/IP through the mainframe, and it requires a lot of attention, but the improvements IBM is talking about should help."

Rounding it out

VM mainframe users won't be left out of the TCP/IP push. VM users will get a boost in telnet support with a new feature that lets them support more than the current limit of 2,000 telnet sessions. A new IP-to-logical unit mapping facility will improve connectivity between downstream devices and the mainframe.

Other improvements include REXX/Sockets programming language support that will let users build VM-based automation applications for the TCP/IP environment.

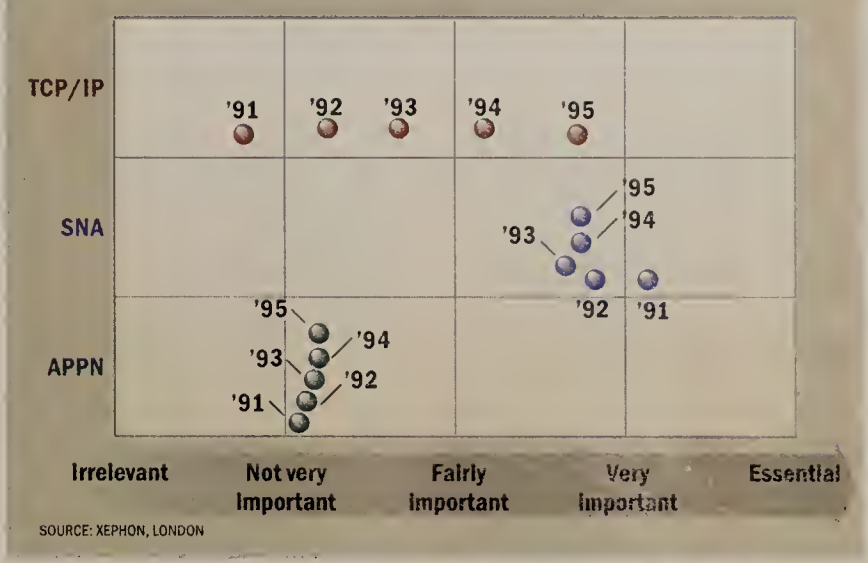
Reser also said VM users will get World-Wide Web server software so they can use the VM systems as a Web site. He noted that a shareware Web server already exists for VM, but the new software will be IBM built and supported.

But the mainframe is not the only IBM product that will get improved TCP/IP support. Reser said VM and OS/2 Warp will be receiving some new features. For example, in the wireless and mobile computing worlds, Warp will support TCP/IP communications in the future. A facility to support the transmission of TCP/IP data over devices supporting ATM also will be added.

"The low-end TCP/IP arena is another area IBM has to move faster in because competitors like FTP Software just run rings around IBM here," said Todd Dagres, principal at Montgomery Securities in San Francisco. "The 'Blue IP' strategy is good for IBM users, but outside of that, they have trouble." ■

Growing influence

TCP/IP's significance is increasing in the eyes of 447 mainframe customers asked for their views on TCP/IP, legacy SNA and APPN.



SOURCE: XEPHON, LONDON

Low-end IBM router to double power

On a more immediate note, IBM in the first week of December will unveil a new router that will double the speed and capacity of its low-end internetwork device.

The new 2210 Nways Multiprotocol Router will give users more flexibility in setting up remote branch offices and give IBM a more powerful, cost-effective, entry-level router.

The 2210 will support as many as two LAN adapters — a mix of token-ring or Ethernet — and up to four WAN interfaces at speeds up to T-1. A universal port will support a 25M bit/sec Asynchronous Transfer Mode or ISDN card, allowing users to tie the router into ATM backbones or utilize ISDN as a backup mechanism. The box is built using Motorola, Inc.'s 68040 chipset.

Existing 2210 models support a maximum of one LAN and two WAN ports and are built on Motorola 68360 chips.

"The new router is twice as fast as existing 2210s, and with more LAN, WAN ports and now an ATM option, the 2210 will give users a bunch of options for their branch office environments," said Warren Leach, a senior engineer for IBM's Networking Hardware Division.

The new 2210 runs new software as well. Release 3 of the router's software will support a variety of SNA and TCP/IP connectivity options. For example, the offering will run Data Link Switching, which lets SNA data flow over TCP/IP nets, and support Synchronous Data Link Control and frame relay point-to point protocol communications.

For routing, the box will support the Routing Information Protocol and Open Shortest Path First. It will be able to handle AppleTalk, DECnet, IPX and VINES protocols. The box will also include source route, transparent and source route transparent bridging capabilities.

A future release of the software will support bisynchronous devices and allow frame relay-based data to flow over an ISDN link. Many branch office environments, especially banks with automated teller machines, need the bisynchronous support, Leach noted.

Pricing for the new 2210 was not available.

By Michael Cooney

IBM Internet family to grow

On another TCP/IP front, IBM said it will introduce a slew of Internet features for various products to help users do business on the 'Net.

For Internet access, IBM said it will offer Internet Connection Web server software on its Scalable PowerParallel SP2 systems — the AS/400 and the OS/2 PowerPC.

IBM also said it is working to integrate Lotus Development Corp.'s Notes and cc:Mail packages on top of its existing Web server and client applications so users can exchange data over the 'Net more readily. Internet support for IMS transaction applications is also expected. IBM already supports a CICS/Internet connection.

"We want to make it easy for businesses of all sizes to develop products and services on the Internet," said Jeff Reser, a member of IBM's technical marketing staff.

The strategy is to enable users to build a repository for data, images or video on the IBM platform of their choice and access that data via IBM Internet Connection for OS/2 Warp or other industry software such as Netscape.

"IBM is promising to make the Internet safe for corporate users to take advantage of, but the Internet world is built by fast movers and innovators, and it's still not clear that IBM can fit into either of those categories," said Todd Dagres, a principal at Montgomery Securities in San Francisco.

By Michael Cooney

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IBM brings SystemView to the LAN arena

By Michael Cooney
Raleigh, N.C.

Users looking for a simple but effective way of managing their burgeoning LAN environments can now look to IBM's SystemView line of systems management products.

As expected, IBM last week announced SystemView for OS/2, an integrated package of products designed to help small to midsize corporate users more easily manage servers running OS/2 or NetWare and clients running various editions of Windows (*NW*, May 8, page 1).

The package combines the best of IBM's NetFinity PC-based management platform with the best of SystemView — all on a single management console.

NetFinity lets users discover PC and server resources on a network, as well as conduct software and hardware inventories.

Applications written for NetFinity by independent software vendors, through the NetFinity Partners in Management program, also will run with SystemView for OS/2, according to IBM executives.

SystemView adds software distribution, license management and other capabilities. It also enables users to set automation routines, such as starting an overnight file transfer or restarting a failed device, as well as remotely access and control workstations and servers.

"By combining NetFinity functions with other IBM management products, IBM has integrated, enhanced and simplified its workgroup management offering," said Sylvia Clark, senior analyst for the Aberdeen Group, Inc. consultancy based in Boston.

SystemView for OS/2 is one member of the IBM SystemView Series, which also includes the AIX workstation and OS/400 mid-range and MVS mainframe platforms.

"SystemView for OS/2 is designed for smaller customers who must manage their PC networks — without spending a bunch of money or training time to do so," said Al Zollar, vice president of SystemView development in IBM's Networking Software Division.

On another note, IBM will port the SystemView for OS/2 package to Windows NT early next year, so users deploying Windows NT servers can manage them across the enterprise (*NW*, Oct. 30, page 1).

SystemView for OS/2 will be available later this month for $499. An upgrade from NetFinity will cost $99.

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In-Site

Continued from page 1

FDDI network shared by 35 users just wasn't fast enough for the firm's government department money desk.

A Federal Reserve Bank rule imposed last year charges late fees for transactions that do not get reported on time, and those fees — levied by the minute — were costing $3,000 to $5,000 per day, according to Jeff Speight, chief networking officer at DLJ.

The FDDI LAN was staggering under the load of four custom, real-time trading applications that the 35 brokers relied on to make split-second decisions on the trading floor. As business increased, the demand slowed response times.

Jeff Speight *says ATM has brought 'network simplicity' at his firm.*

When considering possible solutions, the department rejected switched Ethernet because it would not have been any faster. Even with 35 users, the FDDI net was delivering, on average, more than 10M bit/sec per user, Speight said.

Asynchronous Transfer Mode appealed to the department because each workstation would have dedicated high-speed network access, and bandwidth would not be affected by network use. It also liked the fact that ATM offers higher speeds than other technologies and plenty of headroom for growth.

Because DLJ did not want to serve as a proving ground for an industry newcomer, it chose ATM pioneer Fore Systems, Inc. as its equipment supplier. DLJ installed three ForeRunner ATM switches linked by a Synchronous Optical Network (SONET) ring. Each 486 PC desktop gets 100M bit/sec bandwidth, and Pentium PCs get 155M bit/sec.

In the year since the ATM LAN was installed, processing time for transactions has dropped from .33 second to .16 second. Overdraft fees are now less than half of what they were — ranging from $1,000 to $2,500 — with a significant amount of the savings being due to the faster network, DLJ said.

Based on those results, the firm has taken a deep breath and committed to expanding ATM to the firm's metropolitan-area network, which spans the Hudson River between DLJ's Manhattan headquarters and its data center and support office in Jersey City, N.J.

The company is planning to tear out its time-division multiplexer (TDM)-based DS3 network based on Network Equipment Technologies, Inc. multiplexers and replace it with an ATM backbone using five StrataCom, Inc. IGXs. The IGX is a 1.2G bit/sec ATM switch with interfaces for legacy data and voice that comes in 16- and 32-slot versions.

The ATM network, which was turned up Oct. 15 and is currently undergoing load-testing, is scheduled to swing into operation by the end of the year.

The DS3 ATM backbone links between the firm's headquarters and data center are provided by NYNEX Corp., Bell Atlantic Corp. and MFS Communications Company, Inc.

For redundancy, they are backed up by a leased microwave connection. There also are two IPXs on either side of the Hudson River for redundancy, and every carrier link has a primary and alternate route, with the alternate always provided by a different carrier than the primary.

The data center is connected to the support office two blocks away with dual-fiber lines, owned by the firm, that are outfitted to carry fractional DS3 traffic.

Whereas the TDM backbone required 20 separate pieces of equipment with multiple management platforms, the ATM net requires just the five IGX switches with a single StrataView management platform. "It's brought network simplicity," Speight said.

The network is also opening doors for new high-bandwidth applications, including videoconferencing among offices, document imaging to reduce paper-pushing and TV feeds to traders' desktops to update them on news that affects trading.

In addition, Speight said he is looking at shutting down voice T-1 lines among the offices and riding intracompany voice traffic on the network for free.

The longer view

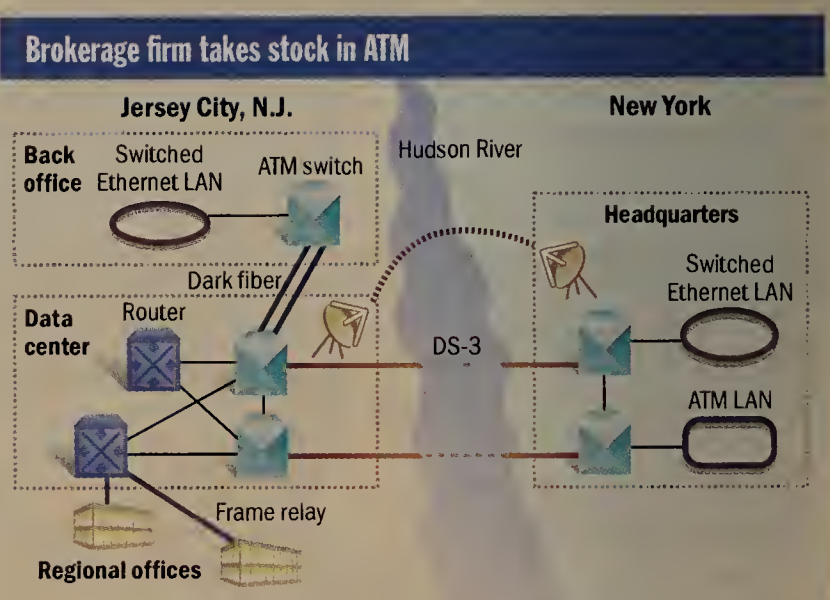
Long term, the company plans to install ATM LANs in other departments at headquarters. Looking forward to that day, the company is already installing dual cards in new PCs — one for the current switched Ethernet and one for ATM.

Speight said he chose the IPXs because they support both legacy Ethernet traffic and ATM, and put the firm in a position to extend ATM beyond New York and New Jersey to the firm's six regional offices.

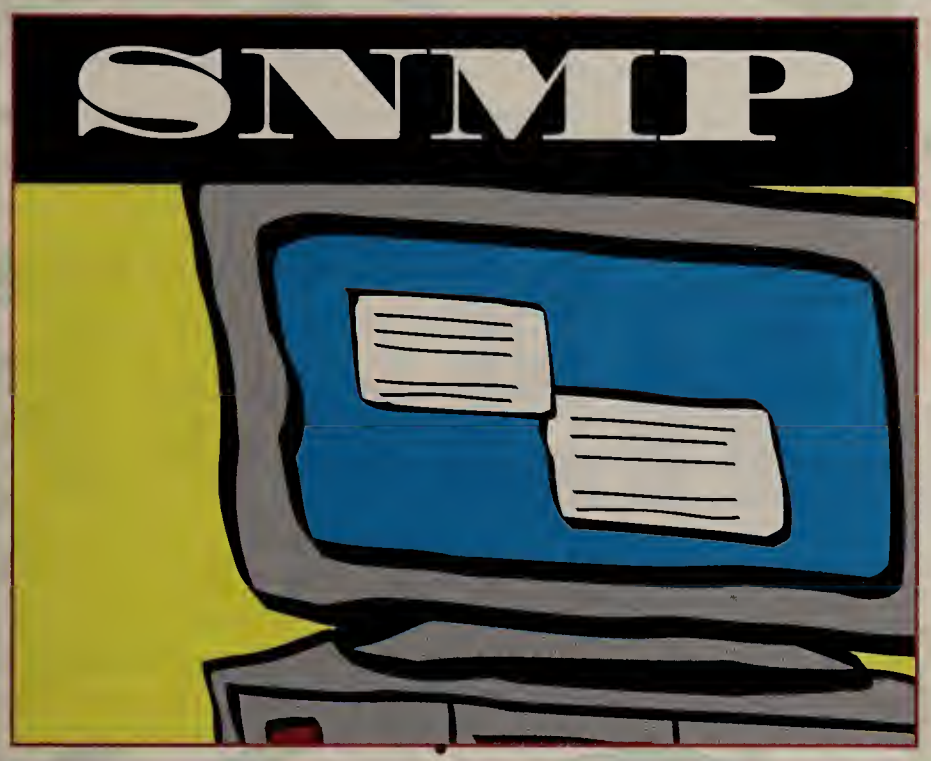
While ATM offers immediate improvements, the major benefit Speight sees is that the net can grow and still maintain speed, and that is key for DLJ's competitive edge.

"Here on Wall Street, information is king, and the guy who's fastest with that information has the advantage," Speight said. ■

Brokerage firm takes stock in ATM



With an ATM LAN already handling securities trading information for one department, DLJ is load-testing ATM switches for a metropolitan-area network and has left the door open to extend ATM to its regional office WAN.



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Back to Reality

National ISDN's third birthday is nothing to write home about

Last week, retired Gen. Colin Powell said he would not run for the presidency or any other elective office in 1996. Three people were glad to hear this news: Bill Clinton, Bob Dole and Mrs. Powell. (I think he really wanted the jet.)

Supporters had great expectations for a Powell presidency. Perhaps too great. The ultracautious general lacked the ingredients to paint a clear agenda and motivate people to see it through.

The palpable disappointment that followed Powell's announcement mirrors a similar reaction to the lofty promises and track record of another knight in shining armor — Integrated Services Digital Networks.

David J. Buerger

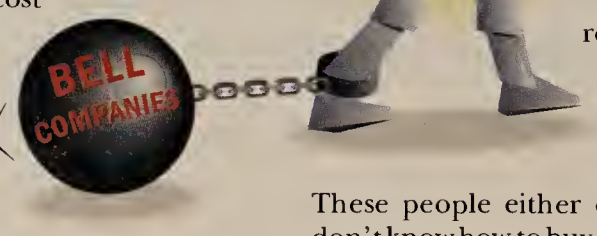
This week, the Corporation for Open Systems International (COS) celebrates the third anniversary of National ISDN 1, an initiative aimed at bringing fast, interoperable digital service across the U.S. It will celebrate at Comdex in Las Vegas at an event called ISDN Solutions '95, sponsored by 25 companies (down from 37 last year).

On the surface, ISDN technology seems to finally be on a roll. According to COS, deployment is up from 300,000 lines at the end of last year to almost one million lines. More than two-thirds of the 114 million access lines served by the seven regional Bell operating companies are capable of running ISDN.

Theoretical availability is one thing, but actual use is another. By COS' own admission, ISDN is still used on less than a whopping 1% of all telephone lines. Not bad for a decade-long power crusade.

I decided to pose as a customer to gauge the state of availability and cost of Basic Rate Interface service. I called toll-free numbers published in the COS ISDN Solutions guide.

Ameritech's operator said it charges a $135 installation fee, a $34.64-per-month line cost plus usage fees. The line fee costs $20 per month extra if you live farther than three miles from the central office (CO). Installation takes 10 to 15 working days.



The call to Bell Atlantic was answered with a recording that said service is planned in the "near future," pending tariff approvals. "Please leave your name and address or E-mail address, and we'll notify you later this year." Sounds like "switch and bait."

BellSouth's fees in Atlanta have dropped dramatically. The operator said installation costs $197.50 plus $62.40 per month for unlimited usage. Installation requires up to nine days, longer if CO work is required.

GTE's operator said installation costs can run up to $210. Users pay a $60 monthly line fee plus usage fees. Installation requires 10 to 14 working days.

NYNEX's voice response system answered: "If you are a vendor, press 1; sales channel, press 2; a customer, press 3." Hmm. The faxed-back collateral was improved from a year ago. For Long Islanders, installation costs $225, or $300 if you live more than three miles from a CO. The monthly line fee is $24.20 or $34.20, respectively — plus usage charges. In typical New York fashion, NYNEX gave no estimate for installation time. (It's a union thing.)

Pacific Bell's answering system was awful. When I finally got an operator, he told me they'd waive the $125 installation fee if I signed up for two years. The monthly charge is $24.50 plus usage. Installation takes seven to 10 days.

SBC Communications' system was not much better. Callers are greeted by the words: "Main menu. To hear about DigiLine, press 1; Smart Trunk, press 2; Select Video Plus, press 3." Huh? I guess its customers are intimately familiar with brand names. An operator said installation costs $578 (not including equipment), with a monthly flat rate of $57.70. Such a deal. Installation takes three to nine days.

US WEST's average installation fee is $91.38, with an average monthly line cost of $64.50 plus a usage fee. People in six of the carrier's service coverage states are charged on an "individual case basis," which means US WEST would rather chase easy new business in other Bell regions, instead of building an ISDN infrastructure for regular local customers.

Ironically, none of the Bell operators had heard of Bellcore's Simplified Ordering and Provisioning, aimed to ease ISDN purchasing.

The Bell companies have improved ISDN marketing — sort of. But it may be too little too late. The product's growth is anemic compared to that of the Internet. According to a recent Nielsen survey, the Internet user population in North America is 24 million people over the age of 16. You'd think a lot of them would be using ISDN. These people either don't understand the service or don't know how to buy it. Or, maybe they don't want it.

ISDN — despite its claim to speed — is too slow for downloading massive Web graphics. Evolving alternatives are more appealing, such as Internet links through cable TV services or satellites. Hughes Network Systems' DirecPC provides 12M bit/sec Internet feeds for $39.95 a month. The satellite gear costs $995, just twice the price of some 128K bit/sec ISDN termination hardware.

Do I feel sorry for ISDN's relative failure? Sure. But not for the phone companies that bungled its rollout. We'll just select the next option.

Buerger is an Atlanta-based writer and industry consultant. He can be reached at dbuerger@pipeline.com.

ABEND

abend *(n)* **1:** abnormal end to a computer process **2:** the column that spares no expense to bring you the insights of Internet users and other high-tech wits

Top 10 signs you're Webbed-out

(from all over)

10. Your opening line is, "So what's your home page address?"

9. Your best friend is someone you've never met.

8. You see a beautiful sunset and you half expect to see "Enhanced for Netscape 1.1" on one of the clouds.

7. You are overcome with disbelief, anger and, finally, depression when you encounter a Web page with no links.

6. You feel driven to consult the "Cool Page of the Day" on your wedding day.

5. You are driving on a dark and rainy night when you hydroplane on a puddle, sending your car careening toward the flimsy guardrail that separates you from certain death. You look for the "Back" button.

4. You visit "The Really Big Button that Doesn't Do Anything" again and again.

3. Your dog has its own Web page.

2. So does your hamster.

1. When you read a magazine, you have an irresistible urge to click on the underlined passages.

Limericks for idle (computer room) moments

(http://vscoms.cren.ch:8000/limericks/main_limericks.html)

We really don't know who's to blame,
Five PCs on a course just went lame.
After days of distress
And a great deal of mess,
We discovered they had the same name.

Announcing Hacker Barbie

(Dylan Northrup)

This new line of Barbie dolls comes equipped with Barbie's very own X terminal. The new Barbie has the incredible ability to stare at the screen without blinking her eyes and to go without eating or drinking for 16 hours straight. Her vocabulary mainly consists of technical terms such as, "I like TCP/IP!," "Bummer! Your kernel must have gotten trashed" and "Can't you grep that file?" The Hacker Barbie's Ken is an incompetent management consultant who frequently asks Barbie for help.

2:24 PM
10,000-page run under way.

2:25 PM
Printer speaks to you in strange new language.

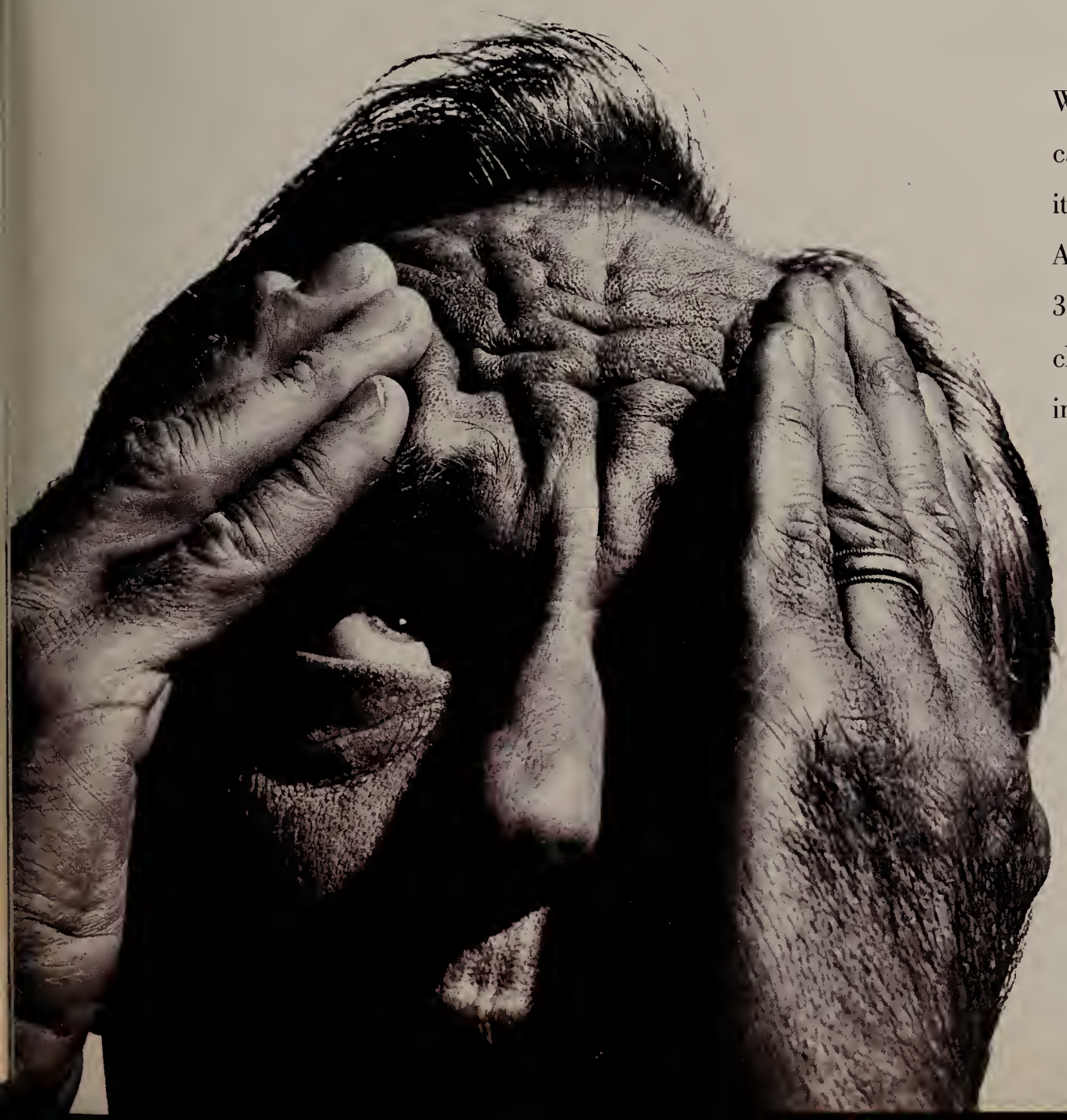
ERuppp ERuppp ERuppp ER

2:26 PM
Call service supplier and try not to panic.

5:16 PM
Service guy finally arrives.

5:59 PM
Can't help, he says, it's a network thing.

6:00 PM
Panic. Visualize IBM printers to calm down.



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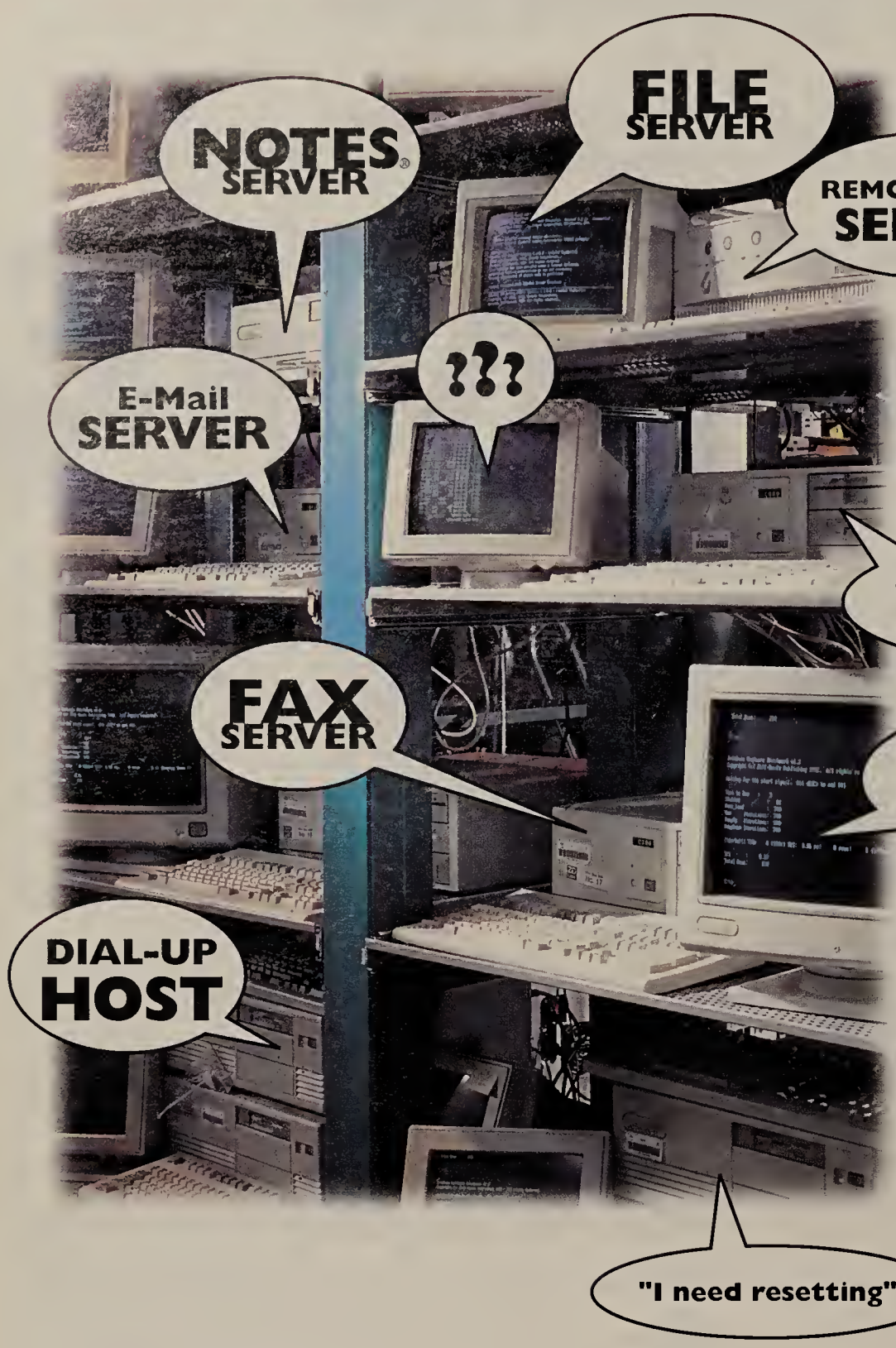

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